UNIVERSIDADE DE LISBOA

Faculdade de Medicina Veterinária

BUILDING SAFE FOOD CHAINS IN DEVELOPING COUNTRIES – IMPLICATIONS OF A CASE STUDY – MOZAMBIQUE

MARGARIDA DOS SANTOS CORREIA

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Doutor Rui José Branquinho de Bessa

Doutora Ana Rita Barroso Cunha de Sá Henriques

Doutor Ian Charles Goulding

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Dissertação de Mestrado em Segurança Alimentar

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To my Son, and to all the Children in the World, in the hope for a better future.

Acknowledgments

I would first like to thank and express my profound gratitude to my parents. There are not enough words to express my feelings so I would just thank them for always being there for me and making me the woman I am today. It's never too late to chase our dreams.

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Abstract

Food Safety and Food Security are intrinsically linked. Food security issues faced by developing countries, like famine, malnutrition and starvation have tended to dominate the policy agenda, leaving food safety as a secondary issue with both governments and stakeholders struggling to enable this important health and trade factor to be taken into account. The purpose of this case study is to analyse, and delve into, the food safety status in Mozambique, a developing country in Africa, streamlining the food safety considerations and recommendations of key points that could guide towards the achievement of safer food chains. This struggle can be seen in the reality experienced by entrepreneurs of the food industry when trying to implement an effective and legally compliant food safety system from farm to fork. Despite the efforts of international organizations to strengthen food safety in African developing countries, case study experience shows that huge gaps and challenges remain. While a number of countries and subsectors in the African region have achieved notable progress in implementing food safety strategies, many are still struggling. Like other developing countries, Mozambique urgently needs to address food safety concerns as a whole including public health, domestic and international market perspectives, with the proper involvement of all stakeholders.

Keywords: Food safety, Developing countries, Public health, Trade, Safe food chains

Resumo

A Segurança Alimentar e a Segurança dos Alimentos estão intrinsecamente ligadas. Situações de insegurança alimentar vividas em países em desenvolvimento, como a desnutrição e a fome, tendem a dominar as agendas políticas. Neste sentido os assuntos relacionados com a segurança dos alimentos ficam em segundo plano. As entidades governamentais ficam, como todas as outras partes interessadas, numa luta constante para conseguir ter em conta este elemento tão importante para a saúde pública e para o comércio.

O estudo de caso desenvolvido neste trabalho pretende analisar o estado de desenvolvimento da segurança dos alimentos em Moçambique, um país em desenvolvimento do continente Africano. Ao descrever a realidade vivida por um operador do setor alimentar que tenta implementar na sua empresa uma metodologia de segurança dos alimentos “do prado ao prato”, pretende-se delinear as situações experienciadas.

Embora vários países e subsectores da região africana tenham alcançado progressos notáveis na implementação de estratégias de segurança dos alimentos, muitos ainda estão na expetativa do seu alcance.

Moçambique, tal como outros países em desenvolvimento, necessita urgentemente de abordar as preocupações com a segurança dos alimentos como um todo, incluindo a saúde pública, as perspetivas do mercado interno e internacional, garantindo o envolvimento adequado de todas as partes interessadas.

Palavra-chave: Segurança dos alimentos, Países em desenvolvimento, Saúde pública, Mercados nacionais e internacionais, cadeias de alimentos seguros

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Acronyms

AIDA	Action Plan for the Accelerated Industrial Development of Africa
AU	African Union
AUC	African Union Commission
BTSF	Better training for Safer Food
CA	Competent Authority
CAADP	Comprehensive Africa Agriculture Development Programme
CAC	Codex Alimentarius Commission
CCP	Codex Contact Point
CCS	Country Cooperation Strategy
CEMPRE	Census of Business Organisations
CGAP	Consultative Group to Assist the Poor
CIA	Central Intelligence Agency (USA)
CPF	Country Programming Framework
CPS	Country Partnership Strategy
DALY's	Disability Adjusted Life Years
DFID	Department for International Development (UK)
DNAV	National Veterinary Directorate
DNEAP	National Directorate for Studies and Policy Analysis
DNSV	National Directorate of Veterinary Services
DREA	Department of Rural Economy and Agriculture
DSA	Department of Environmental Health
DSV	Plant Protection Department
EPA	European Economic Partnership
EU	European Union
FAO	Food and Agriculture Organisation
FBD	Foodborne Diseases
FBO	Food Business Operator
FES NET	Famine Early Warning Systems Network

FRELIMO	Front for the Liberation of Mozambique
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GFSP	Global Food Safety Partnership
GMP	Good Manufacturing Practices
GNI	Gross National Income
HACCP	Hazard Analysis and Critical Control Point
HDI	Human Development Index
HIPC	Heavily Indebted Poor Countries
IAPSC	Inter-African Phytosanitary Council
IBAR	Inter-African Bureau for Animal Resources
IBRD	International Bank for Reconstruction and Development
ICSID	International Centre for Settlement of Investment Disputes
IDA	International Development Association
IFC	International Finance Corporation
IFCS	International Food Safety Complex in Southern Africa
IIAM	Biotechnology Laboratory
IMF	International Monetary Fund
INAE	Inspeção Nacional Atividades Economicas
INE	National Instute for Statistics
INIP	National Institute for Fisheries Research
INNOQ	National Institute of Standardization and Quality
IPAC	Portuguese Institute of Accreditation
ISID	Inclusive and Sustainable Industrial Development
ISO	International Standardization Member
LDC	Least Developed Countries
LIP	Fisheries Inspection Laboratory

LNHAA	National laboratories for the Hygiene of food and water
MASA	Ministry of Agriculture and Food Security
MDG	Millennium Development Goal
MDM	Mozambique Democratic Movement
MIC	Ministry of Industry and Commerce
MIGA	Multilateral Investment Guarantee Agency
MINAG	Ministry of Agriculture (Mozambique)
MIP	Ministry of Fisheries
MISAU	Ministry of Health
MZN	Mozambican Metical
NM	Mozambique Technical Norms
OAU	Organization of African Unity
OIE	World Organisation for Animal Health
PCP	Programme for Country Partnership
PEDSA	Strategic Plan for Agricultural Development
PEI	Policy and Industrial Strategy
PPP	Purchasing Power Parity
PPPs	Public Private Partnerships
PROAGRI	Agriculture Development Programme
RECs	Regional Economic Communities
RENAMO	Mozambican National Resistance
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SETSAN	Technical Secretariat for Food Security and Nutrition
SME	Small and Medium-sized Enterprise
SPS	Sanitary and Phytosanitary Measures
STCs	Specific Trade Concerns
TBT	Technical Barriers to Trade
TRIPS	Trade Related Aspects of Intellectual Property Rights

UN	United Nations
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
UNSAID	United States Agency for international Development
UNSD	United Nations Statistics Division
USDA	United States Department of Agriculture
VETGOV	Reinforcing Veterinary Governance in Africa
VLSP	Veterinary Legislation Support Programme
WBG	World Bank Group
WCO	WHO Country Office
WEF	World Economic Forum
WFP	World Food Programme
WHO	World Health Organisation
WTO	World Trade Organisation

1 Introduction

1.1 Motivation and subject relevance

The Universal Declaration of Human Rights, proclaimed by the United Nations in 1948 establishes the concept of Right to Food (article 25) as a fundamental human right to be universally protected. In 1996, the World Food Summit defined food security in its multidimensional nature declaring that “Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (Food and Agriculture Organization [FAO], 1996). Food safety is therefore an intrinsic element of food security (United States Department of Agriculture [USDA], 2003).

Although human development over the past two decades has been striking in many fronts, the gains have not been universal (United Nations Development Programme [UNDP], 2015). Imbalances still exist across countries and millions of people are yet to reach their full potential in life because they suffer deprivations in some or all multiple fronts of human development (UNDP, 2016).

In 2015, countries adopted a set of goals as part of a new Agenda for Sustainable Development (UNDP, 2015). The new Agenda recommits to the Millennium Development Goals and seeks to complete what they did not achieve, particularly in reaching the most vulnerable. These goals have specific targets to be achieved by 2030 and Food Security is once more a subject of relevance that needs to be addressed effectively.

Access to stable, consistent and safe food is a pressing problem in the African continent (FAO, 2015). Food safety has been overlooked by the fact that food insecurity is a pressing issue worldwide (FAO, 2016[a]). Food security issues like famine, malnutrition and starvation have tended to dominate the policy agenda, leaving food safety as a secondary issue and both governments and stakeholders struggle to seek solutions to have this important health and trade key factor taken into account (World Health Organisation [WHO], 2015).

Food is considered safe if free from hazards that can cause illness when consumed (WHO, 2006). Food safety and food security and nutrition are intrinsically linked, and this fact becomes more obvious in places where food supplies are scarce (WHO, 2014).

Notwithstanding the continuous high levels of concern, experts regard food in developed countries as being much safer to consume than ever before in history (Jabbar & Grace, 2012). However, the misfortune of foodborne diseases (FBD) being played out in the developing world. Unsafe water, sanitation and hygiene as well as poor food-production processes and food handling along with the absence of inadequate food storage all contribute to a high-risk environment (WHO, 2015).

Food safety requirements and a national food control system includes elements such as food laws and regulations, food control management and organization, official control and inspection services, monitoring, and epidemiological surveillance. Also, of importance are factors like training, consumer's education and information (FAO, 2015).

Government authorities are responsible for enforcing food law as well as monitoring food related business operators to ensure they comply with the requirements in order to guarantee consumer protection. To accomplish this, they should keep up with scientific methods and a system of official controls and lay down rules on measures and penalties applied for noncompliance. The primary responsibility for ensuring that foods and feeds comply with food legislation requirements falls to food and feed business operators along the food chain continuum (Southern Africa Development Community [SADC], 2011).

In developed countries access to safe food is considered to be a natural right of every citizen and assurance of safe food is equally considered an obligation of the government and businesses. Such rights and obligations are formalized in various public policies, business policy statements, government regulations and company codes. In most developing countries the situation may not be as simple and straightforward. Some countries may have explicit public policy statements supported by regulations for assurance of safe food and others may have inadequacies in respect of the practise of this (Jabbar & Grace, 2012).

In developing countries food safety is often an overlooked problem by both the government and other secondary actors therefore needing concerted global effort (Chan, 2014). When food supplies are insecure, issues like hygiene, safety and nutrition become secondary and are often ignored, posing food as a health risk (WHO,2014).

Foodborne diseases affect significantly people's health and have other major consequences for individuals, families, businesses, communities and national economies (Kaferstein, 2003). These diseases, and the burden imposed on health systems, markedly reduce well-being and also economic productivity, perpetuating the cycle of poverty (WHO, 2015). Since poor food safety conditions also undermine trade, in developing countries, efforts to improve food safety have been focused on market access requirements associated with high value products, particularly exports, rather than food safety being considered an essential public health issue for all countries (Unnevehr, 2014).

According to the World Health Organization (WHO) regional office for Africa, while a number of countries and sub-sectors in the African region have achieved notable progress in implementing food safety improvement strategies, many are still struggling to tailor their traditional food control systems to current food safety challenges (FAO/WHO, 2005).

In December 2015, the World Health Organization released estimates of the burden of human disease attributable to consumption of food contaminated with 31 infectious agents or

chemicals. The report concluded that exposure to contaminated food worldwide in 2010 resulted in 600 million episodes of illness (95% uncertainty interval, UI: 420–960 million), 420 000 deaths (95% UI: 310 000–600 000) and 33 million disability-adjusted life years (DALYs)[1] (95% UI: 25–46 million) (WHO, 2015).

According to this WHO study, Africa had the greatest burden of diarrhoeal disease from contaminated food among all age groups: 687 DALYs (95% UI: 369–1106) per 100 000 population compared with 229 (95% UI: 160–323) per 100 000 globally and 23 (95% UI: 13–33) per 100 000 in Europe. These differences found in the global estimate suggest that implementation of preventive measures in low and middle-income countries could prevent substantial foodborne disease also delivering considerable economic benefits (WHO, 2015).

In the context of Africa, the costs of food safety and the accompanying risks have been a major concern (Grace, 2015). The 1998 cholera outbreak in Tanzania, caused by ingestion of water or food contaminated with *Vibrio cholorae*, cost the country approximately US$ 36 million (WHO, 2005). A subsequent outbreak of cholera that spread over 28 countries in 2004 led to 85 807 cases of which 2 221 resulted in death (Ali *et al* 2011). In the same year, an outbreak of acute aflatoxicosis occurred in Kenya, where 317 cases and 125 deaths were reported, turning this human aflatoxin foodborne episode into one of the most severe in history (Probst, C. *et al*, 2007). Between 1970 and 2011, African countries reported 3 221 050 suspected cholera cases to the WHO, with Sub-saharan countries accounting for 86% of the reported cases (Mengel *et al,* 2014). In Nigeria, foodstuffs contaminated by aflatoxins, worth approximately US$ 200 000, had to be destroyed (Darwish, *et al,* 2014).

In the first decade of the millennium, African countries recognized the need to increase attention to create and strengthen food safety systems and with guidance from the FAO/WHO governing bodies, national and regional resolutions were taken to achieve "Practical Actions to Promote Food Safety" (FAO/WHO, 2005).

All developing regions, except Africa, have reached the Millennium Development Goal (MDG) of halving poverty between 1990 and 2015 (United Nations [UN], 2015). Expectations will now be directed to the set of new global development goals (the Sustainable Development Goals [SDGs]), which include the ambitious target of eradicating poverty worldwide by 2030. The potential for a considerable slowdown in economic growth and projections that the world's poor will be increasingly concentrated in Africa even if the average 1995–2014 growth rates are maintained suggest the need to focus the global poverty agenda on Africa (Beegle, *et al* 2016).

[1] DALYs for a disease or health condition are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality in the population and the Years Lost due to Disability (YLD) for people living with the health condition or its consequences: DALY=YLL+YLD

Food safety needs to be seen not only as an important public health issue but also as a market development subject (Delgado *et al* 1999). Safe foods provide upkeep to the development of national economies, trade and tourism as well as contributing to food and nutrition security supporting sustainable development (WHO, 2015).

1.2 Objectives and Methodology

The purpose of this study is to analyse and delve into the food safety status of one of the listed Least Developed Countries (LDC), Mozambique, and look at the capability of the system in place to result in trusted food safety for all stakeholders involved. The final aim of the dissertation is to provide an overview on how food safety is established in Mozambique and to streamline food safety considerations as well as suggest some realistic key points that could direct the achievement of safe food chains in developing countries. By analysing and sharing the results of this specific case, a greater insight of real concerns on food safety matters in developing countries can be achieved and alternative solutions can be adopted.

According to United Nations data, Mozambique is listed as LDC which means it is a low-income country that faces structural obstacles to sustainable development. Mozambique entered the UN list in 1999 when it was recognized as being highly vulnerable to economic and environmental changes and having low levels of the considered human assets (UN, 2017).

Mozambique is considered a resource-rich country and along with others of this kind lives with a fragile development model, with undoubted potential but facing remarkable challenges (World Trade Organization [WTO], 2017).

Like other developing countries, Mozambique needs to address food safety concerns as a whole including public health, domestic and international market perspectives, with the proper involvement of all stakeholders (World Bank, 2017).

For the purpose of this study Mozambique is considered as a case study possibly representing the African situation, considering the dual needs for food safety and development.

Emphasis is placed on a fact-based situation analysis and the reality for food business operators in responding to food laws, standards applied and intervening action of all concerned parties in order to develop food safety regulation and implementation. The objective of this study is to identify the difficulties suffered by a Mozambican food business operator trying to comply with the existing food safety systems.

The case study is directed to a vertically integrated food business operator (FBO) that intends to implement a food safety system in order to provide safe meat products to the national market as a starting point, to increase the quality of the company's production and

look for a future in exports. When putting in place the Hazard Analysis Critical Control Point (HACCP) model, identification of gaps and inabilities of the actual system is made.

This case study examines in depth the problems faced by agrifood producers and the experiences of the enterprise will reflect the country's constraints regarding the official control system currently in place. The chosen methodology acquires a strategic importance as the route to relate identified problems with some of the already known food safety issues in developing countries and by providing a better understanding and possible resolution of the latter.

Out of the 46 studied African countries, twenty-six are reported to be at various stages of assessment of their food safety systems towards the development of food safety policies and programme strengthening (Mensah *et al*, 2012). When comparing Mozambique's food safety development with other developing countries, some lessons can be learned, and a more suitable development approach can possibly be undertaken.

1.3 Chapter outline

This dissertation is divided into six chapters. The first chapter institutes an introduction of the study considering both motivation and subject relevance. It also provides the main objectives of the study presented in this dissertation and describes the chapter outline.

The second chapter is specifically related to Mozambique. Primarily presenting the background of the African situation, followed by a country profile. The chapter highlights topics like political and economic context, agricultural sector and trade focusing as well on food safety, security and sustainable development. Mozambique's profile and stated contexts will help to comprehend the country's rapid expansion pattern with only moderate impact on social development and poverty reduction. It also outlines different sector's relevance to achieving future sustainable development.

The third chapter looks at how food safety governance is coordinated in African countries. Describes the international institutional framework involved in food safety guidance and looks into the national policy, legal and institutional profile for food safety, emphasizing the importance of external donors and the private sector. It outlines the complex structure of the food chain supply safety system, specific roles and functions of each institution and examines the overlapping nature of some of them.

The fourth chapter presents the case study experience based on the development of food safety management systems for a small medium enterprise (SME) operating in Mozambique and the experiences encountered when trying to ensure compliance with the existing national framework and requirements for food safety. It begins with case study presentation, showing the food safety from farm to fork challenges faced by a medium size food business seeking

to establish regional and national markets. A brief description of the safety model applied (HACCP) is presented and its results. Case study findings include the gaps and inabilities of the system and points out the difficulties found throughout the process of outlining the project.

The fifth chapter addresses the current food safety situation in Mozambique based on case study findings. It analyses key governance issues to be addressed, supported by evidence based on literature review, other countries case study and most importantly, on the lessons to be drawn from the case study when addressing food safety.

The sixth chapter is the final section of this study. It provides conclusions and recommendations regarding the key points that could help with the building of safe food chains in developing countries. It puts forward actions, urged to be done by all sectors involved, in order to support improved food safety as well as providing a conclusion of the insight gained by both the research and case study.

2 Country profile

2.1 Continental context

Africa is the world's second largest continent with about 30.3 million km^2 (11.7 million square miles) including adjacent islands and also the second-most-populous with 1.2 billion people as of 2016 (Kaneda & Bietsch, 2016*).* It accounts for about 16% of the world's human population and contains 54 countries, nine territories and two independent states with limited or no recognition (UN, 2017).

Africa remains the world's poorest and most underdeveloped continent, although it has abundant natural resources (Sandbrook, 1996).

From the 795 million people that are undernourished globally, 232 million are located in the African continent (FAO, 2016). Of these latest estimates, Sub-Saharan countries account for 220 million of food insecure people and its regional problems not only illustrate the multifaceted nature of food security, but also suggest that different dimensions require different approaches to successfully improve food security. Around 23.2 percent of the sub-Saharan Africa population is estimated to be undernourished and this number is the highest prevalence for any region and the second highest burden in absolute terms (FAO, 2015).

According to the United Nations Human Development Report in 2015, the bottom 18 ranked nations (172st to 188th) were all African.

2.2 Mozambique overview

Mozambique is a country located in the Southern-East part of the African continent and has a legacy of five centuries of colonial rule and trade relationships with Portugal. It occupies an

area of 800 000 square kilometres and stretches almost 2 000 kilometres from North to South.

The country population in 2014 reached 25.8 million, the majority of which are extremely young, with nearly half of the population (45.4%) aged between 0-14 years, 51.4% between 15-64 years of age with only 3.3% over the age of 65 (Goertz, 2014).

As of 2015, numbers of population reached 27 977 863 according to the latest World Bank database (World Bank, 2017[c]).

It's capital, Maputo, sits on the southern end of the country and geographically Mozambique is bordered by six other countries namely South Africa, Swaziland, Zimbabwe, Zambia, Malawi, and Tanzania.

Figure 1 Map of Mozambique. Source: http://www.maps.com

2.3 Political context

Mozambique gained independence from Portugal in 1975. Mozambique's political reality suffers and holds the scars from the 15-year civil war that followed independence from Portugal, leaving the country and its economy in ruins (World Bank, 2017[a]).

In 1992 the peace agreement marked the transition from civil war to peace, leading up to the country's first democratic elections in 1994 and the emergence of a dominant political force in the country named the Front for the Liberation of Mozambique (FRELIMO).

FRELIMO and the Mozambican National Resistance (RENAMO) are still the main political forces in the country, followed by the Mozambique Democratic Movement (MDM). The formal peace agreement took place in October 1992 and since then FRELIMO has won five successive presidential and parliamentary elections, dominating both political and socio-economic policy formation in the post conflict period (World Bank, 2017[a]).

After the last elections in 2014, Mozambique's fourth president Filipe Nyusi came into office, with FRELIMO holding a strong majority in the parliament but with RENAMO doubling its seats in the national parliament compared to the previous elections in 2009. Recent events point to a deteriorating peace in Mozambique with RENAMO waging a low-level insurgency (World Bank, 2016).

Armed conflict re-started in the central region in 2013 and marked the first break in formal peace agreement. Politics between the main two parties become increasingly confrontational amongst raised stakes for control of power and resources. The situation deteriorated later in 2016 with intensified political tensions casting a shadow on Mozambique's development prospects (World Bank, 2017[a]).

2.4 Economic context

Since 1992 and after civil war ended, Mozambique has been the fastest growing, non-oil economy in sub-Saharan Africa, experiencing huge progress. In the meanwhile, progress in the reduction of poverty has not been parallel with this noticeable growth. Access to the most basic services is still limited, making the numbers astounding, with three out of four people in Mozambique living below the poverty line (DFID, 2017). The geographical distribution of poverty remains largely unchanged aside from the countries rapid economic expansion (World Bank, 2015).

The country experienced solid economic growth between 2002 and 2014, with real Gross Domestic Product (GDP) increasing yearly in the range of 6.4 to 9.9 percent (World Development Indicators, World Bank 2016).

According to the World Bank recent indicators (2016), Mozambique's competitiveness is under extreme stress. The country is increasingly dependent on imported goods and financial capital from abroad, a fact that is demonstrated by the current account deficit.

Referring to World Bank's latest official report of 2017, Mozambique is going through an unsustainable situation. Under the Heavily Indebted Poor Countries (HIPC) project, the external debt stock reduced markedly in a decade (1998-2008) from 160 to 33 percent. With the end of HIPC initiative followed by the government's plans to pursue some ambitious public investments, by 2016 the public debt reached 127 percent of GDP, of which 112 percent is external. The debt crisis was recently aggravated by the revelation of previously undisclosed loans and is placing Mozambique's fiscal outlook under immense pressure.

The Mozambican currency, MZN or Mozambican metical depreciated by 36 percent against the U.S dollar in 2016. The currency weakness accelerated the pace of inflation, making for high prices, unaffordable for most Mozambicans with a disproportionate impact on the poor.

Inflation averaged around 20 percent in 2016, with food price inflation reaching 32 percent (World Bank, 2017[a]).

The Doing Business project of the World Bank provides objective measures of business regulations. Globally, Mozambique ranks 137/190 in the World Bank Group's Doing Business indicators of 2017 and 133/138 in the World Economic Forum (WEF) Global Competitiveness Index (GCI 2016-2017).

Back in 2005 the United States Agency for International Development (USAID) announced through an assessment report that Mozambique's level of corruption was cause for alarm. The degree of corruption was already by then a threat to Mozambique's future development progress, demonstrating structural weaknesses (USG/Mozambique, 2011). Nowadays, the country is rated 27 on a scale of 0 (highly corrupt) to 100 (very clean) on the Corruption Perception Index (Transparency International, 2017).

Corruption, affecting the public sector, does great harm to the country, affecting economic, political and social sectors. It creates unfair advantages for the corruptors, foreign investors withdraw and it lessen the prospects of the already poor (United States Agency for International Development [USAID], 2005) .

The country is richly endowed with substantial natural resources. It has great agricultural potential with undeveloped water resources (World Bank, 2017). Known gas reserves in Rovuma basin provide Mozambique are the third largest gas reserves in Africa (Amanan, 2017). Approximately 20 percent of the population rely on fisheries for some part of their income and employment, and this sector has increased remarkably since 2002, due to processing and commercialization (FAO, 2005). In the future, Mozambique needs to take sustainable advantage of its natural resources and favourable geography in trade, changing the reality of the exports economy. The recent Survey on Mozambican Manufacturing Firms, dated 2012, indicated that only 3 percent of firms are exporters (DNEAP,2013). The development challenge of the country is to convert its impressive economic growth into poverty reduction and to diversify the economy (Schou & Cardoso, 2012).

The past years have been characterized by capital-intensive large projects and low-productivity subsistence agriculture. This pattern of growth had limited linkages with the rest of the economy, increasing inequality and a markedly uneven distribution of poverty concentrated in rural areas (World Bank, 2017).

A more diverse and competitive economy is needed as well as expanded employment opportunities and never neglecting the strengthening of key drivers of inclusion such as improved quality education and health service delivery (World Bank, 2017[a]).

Currently, the World Bank is proposing a country partnership strategy (CPS) that aim to help the country to go positively through this transitional period and to attain the needed development and diversification of the economy (World Bank, 2017[a]).

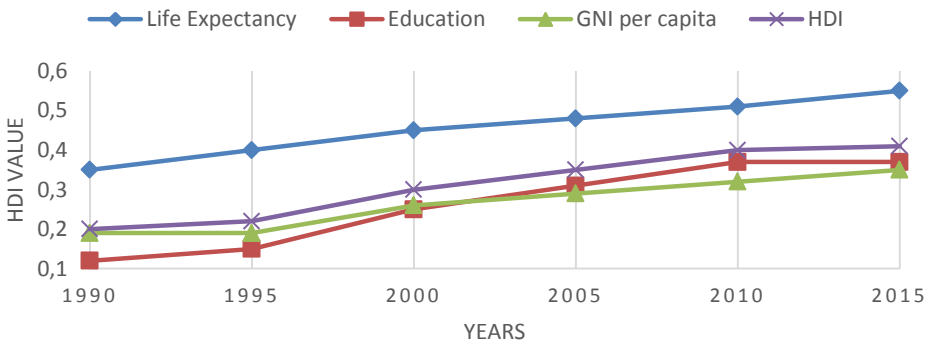
2.5 Human development context

The Human Development Index (HDI) is a measure that allows the assessment of progress in three basic dimensions: a long and healthy life, access to knowledge and a decent standard of living (UNDP,2015). A long and healthy life is measured by life expectancy at birth. Knowledge level is measured by mean years of education among the adult population (average number of years of education received in a lifetime by people aged 25 years and older) and access to learning and knowledge by expected years of schooling for children of school-entry age. The standard of living is measured by Gross National Income (GNI) *per capita* expressed in constant 2011 international dollars converted using purchasing power parity (PPP) conversion rates (UNDP, 2015). These parameters are used to rank countries into four tiers of human development.

Human development is about enlarging human choices focusing on the richness of human lives rather than simply the richness of economies (UNDP, 2015).

According with the latest report on the HDI dated 2015 Mozambique's HDI value for 2015 is 0.418— which put the country in the low human development category—positioning it at 181 out of 188 countries and territories (UNDP, 2015).

Figure 2 Trends in Mozambique's HDI component indices 1990-2015. Adapted from Human Development Report 2016, UNDP



The HDI was created for assessing the development of a country emphasising people and their capabilities and not economic growth on its own. It can also be used to question national policy choices and recognize priorities in government policies (UNDP, 2016).

2.6 Agricultural and livestock sector context

Agriculture is the foundation of the economy in Mozambique. It contributes to 40 percent of the GDP and 60 percent of export revenues with 80 percent of the population involved in agricultural activities. The vast majority of production (around 97%) comes from 3.2 million subsistence farms, with an average size of land of 1.2 hectares. The agricultural practice is based on rain-fed agriculture and the use of traditional varieties of crops, low-intensity fertilizer, and minimal pesticides. With no access to irrigation, mechanization and the high costs for transport the productivity of the sector becomes very low (World Bank & CGAP , 2016).

The commercial agriculture sector is mostly focused on sugar, tobacco, cotton and cashew nuts for export markets. Agricultural exports reached $700 million in 2014, while agricultural imports were around one billion dollars (USDA Mozambique Agriculture Fact Sheet, 2015).

The agricultural subsector that accounts for around 80% of the cultivated area is for food crop production like maize and cassava, sorghum, millet, rice, beans, groundnut, sweet potatoes and a wide variety of vegetables. Tree crops, especially coconut and cashew, grown by small farmers, are an important source of foreign exchange earnings, and contribute to household food security (Vernooij *et al* 2016).

Mozambique's agriculture faces many challenges such as low productivity, limited infrastructures and services for accessing markets, the inadequate use of natural resources and also the need for more coherent and encouraging policies. The low productivity is due to the low availability of, and access to, quality inputs, the limited water for agriculture, the soil infertility and also the limited access to credit as well as high transaction costs (MINAG, 2010).

The primary sector is also very vulnerable to natural catastrophes, drought, flood, cyclone, pests and diseases. being the main sources of production risk (World Bank, 2015).

Mozambique has natural resources and conditions that could enable the long-term development of a more functional and diversified agriculture sector. The land area of nearly 800 000km^2 with agro-ecological potential and 36 million hectares of arable land of which only 10% is in use, makes it urgent that system weaknesses are overcome in order to perform more efficiently and contribute to the prosperity and competitivity of the sector. National studies concluded that 3.3 million hectares can be irrigated minimising the impact of climate change and other variables (MINAG, 2010).

Many strategies from both the government and private sector have been put into place to achieve national development on the sector. Back to 1998, the Agriculture Development Programme (PROAGRI I) was designed to improve coordination of public interventions and directing investments in agriculture. It lasted 5 years and in 2005 PROAGRI II was approved. Later in 2017, due to inflation in the prices of basic foodstuffs, the Council of Ministers

approved the Green Revolution Strategy to respond to the international instability and world economic crisis (MINAG, 2010).

Mozambican agriculture has so far been hidebound by underinvestment, resulting in weak infrastructure and low productivity which precludes access to markets. The agriculture sector also suffers from lack of access to finance, due to the fact that the majority of banks have no efficiency or expertise in Agriculture financing (Albuquerque & Hobbs, 2016).

Agricultural exports, encouraged by a liberalized trade regime, have grown steadily with cash crops like sugar cane, tobacco, cotton and cashew representing its majority (WTO, 2017).

Nowadays the Strategic Plan for Agricultural Development in place also known as PEDSA was founded in Mozambique's 2025 vision as an integrated, prosperous, competitive and sustainable agriculture sector. It was created with a participatory approach and will be implemented through a flexible and interactive learning process that takes into account the specificities of each province (MINAG,2010).

As agriculture remains the mainstay of the African economy, developing a strong "from farm to table" food safety system is the shield for both imports and export markets (FAO, 2011).

Livestock as part of the primary agricultural sector plays a vital role for the rural population (INE, 2011). It represents 10 percent of the total agricultural production and accordingly with the World Organization for Animal Health (OIE) Report of 2008 contributed with 1.7 % of GDP. The vast majority of rural families own livestock with around 65% possessing chickens, 25% small ruminants (mainly goats), 12% having pigs and 6% have cattle (MINAG, 2010). Based on 2008 data of the National Directorate for Veterinary Services of the Ministry of Agriculture, meat production is growing at an average annual rate of 17%, and eggs and milk at 9%.

The potential value of the livestock sector in Mozambique is substantial as it relies on the same natural resources previously pointed out for the agricultural sector. The subsector suffers from the same low productivity mainly caused by poor vigilance and disease control capacity (surveillance and eradication) and the deficient supply of veterinary services (OIE, 2015).

As described in the recent publication Livestock Development in the Zambezi Valley, Mozambique: Poultry, Dairy and Beef Production Description of the current situation and emerging opportunities released in 2016, Mozambique is highly dependent on external markets due to the limited supply of national livestock products. Around 32.5% of meat, 83% of milk and 90% of eggs is imported. Most of the considered inputs for livestock production such as feed, medicines, vaccines and veterinary instruments are also imported. There are several feed industries in the country but many of their inputs such as soya and maize are also imported (Vernooij, Anjos & Mierlo, 2016).

2.7 Mozambique and trade

In recent decades Mozambique's export base has moved away from traditional exports, that dominated the first post war decade, such as prawns, cotton, timber, cashew nuts and sugar, to mining-related exports from megaprojects (WTO, 2017).

Mozambique's export basket is somewhat limited and reflects the narrow scope of the economy: in 2015 only four items (aluminium, coal, gas and electricity) accounted for almost 63% of exports. Main imports are manufactured goods (67% of imports), foodstuffs and other agricultural products (13%), and fuel and mining products (Trading Economics, 2017).

Mozambique trade in goods with the World in 2015 reached $3.2 billion (bn) in exports, $7.9 bn in imports and a negative trade balance of $4.7 (UNSD Comtrade database). The value of merchandise exports decreased substantially by 32.4 percent while its merchandise imports decreased moderately by 9.6 percent when compared with the previous year. Declining exports were mainly due to the prolonged weak global demand for merchandise, particularly aluminium, but also to the El Niño drought effects, that curtailed the production of traditional cash crops, posting drops in agriculture exports averages (UNDP, 2017). South Africa was the 2nd largest export market for Mozambique (18.3% of Mozambique exports) and the 1st largest import market for Mozambique (30.1% of Mozambique imports) in 2015 (UNDP, 2017).

Trade is a key factor for integration into the world economy and a powerful means for developing countries to promote economic growth, development and poverty reduction (IMF, 2001). The World Bank, by promoting the notion that access to markets is a mandatory part of developing countries development is also increasingly demanding attention for the overcome of restrictions imposed by developed countries on international trade. Trade limiting factors in third world countries in their majority rely on economical background, poor infrastructure and straggled technical skills (Schillhorn van Veen, 2005). Further opening by both industrial and developing countries are needed to liberalize and realize trade's potential as the cornerstone for economic growth and development (IMF, 2016).

The development and implementation of appropriate policies and strategies in some African countries, regarding agricultural trade is yet to be achieved, limiting the potential benefits of this growth key factor (FAO, 2015).

2.8 Food security in Mozambique

Mozambique has made significant steps in improving the food security situation in recent years. Along with 18 countries in sub-Saharan Africa, Mozambique has reached the target of Millennium Development Goal 1 (MDG 1c), by halving the proportion of hungry people or bringing it under 5 percent by 2015 (FAO, 2015).

Although food security improved in urban areas between 2009 and 2013 it has worsened in rural Mozambique (WFP, 2016). By 2013, there was a clear north to south and urban vs rural division. There was poorer household food consumption in the northern provinces and the prevalence of food insecurity in rural areas was nearly double than of urban areas. In urban areas, economic access to food is a major issue, especially in times of raised food prices whilst for the rural population the main constraints are physical access to food (limited markets and bad quality roads) as well as the natural disasters suffered by smallholder farmers and population that cause fatalities, casualties, illness and also destroy infrastructure, crops and livelihoods (WFP, 2016).

Malnutrition in Mozambique is underlined mainly by inadequate nutritional intake, poor breastfeeding practices accompanied by teenage pregnancy, low frequency meal and high levels of disease (WFP, 2016).

Poor food utilization is common and access to both health and sanitation services is limited with only 36 percent of the population having access to potable water (SETSAN, 2002).

Following the recent drought, caused by *El Niño* 2015/16, the worst in the past 35 years, it is estimated by SADC that more than 23 million people in southern Africa are deemed to be food insecure, of whom 1.5 million live in Mozambique (FEWS NET, 2016; SADC, 2016). Sustained deficits, due to failed harvests also created shortfalls in neighbouring countries interfering with regional trade and making the imports a non-viable solution to the shortfall. Reduced food availability, the vulnerability to long term climate change and the actual domestic economic difficulty that Mozambique has been through poses remarkable challenges to the region's supply chain (SADC,2016).

A study conducted by Pitoro and Chagomoka (2017) assessed Mozambique's household food security trends and drivers and reached the conclusion that food insecurity in rural Mozambique is not only due to agriculture failure but is far worsened by a systematic socioeconomic failure, and provided several policy implications that could prevent such failure and alleviate food insecurity.

The World Food Programme (WFP) is currently developing its new Country Strategic Plan for the period 2017-2021 for the country. The new strategy intends to help the Government in the achievement of the SDG2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture) and to support the accomplishment of the Agenda 2030 (WFP, 2016).

2.9 Food safety in Mozambique

Food safety and control systems in several African countries was reviewed by FAO in 2002, when Mozambique announced that it is in the process of drafting a policy and strategy as well as an action plan (FAO, 2002).

Research regarding food safety regulations and implementation in Mozambique shows that as many as thirteen institutions are involved. No single institution has overall responsibility for the entire system. Many of the involved institutions play similar roles resulting in overlapping tasks with no coordination mechanism between them (Jabbar & Grace, 2012).

The food safety policy is driven by the Department of Environmental Health at the Ministry of Health, whilst the inspection services are carried out by different agencies. The main food laws in Mozambique date from the 1980's, and were later (1994) consolidated in the *Colectânea de Legislação no Âmbito da Higiene Alimentar.*

According to the WHO Estimate of the Global burden of foodborne diseases Mozambique is classed as African Region on Stratum E, meaning high child mortality and very high adult mortality. African median rates of foodborne illnesses, deaths and Disability Adjusted Life Years (DALY's) are shown on table 1:

Table 1 African median rates of foodborne illnesses, deaths and Disability Adjusted Life Years (DALY's) with 95%UI uncertainty interval adapted from WHO Estimate of the Global burden of foodborne diseases,2005

DISEASE / PATHOGEN	**AFRICA REGION**		
	Ilnesses (95%UI)	**Deaths (95%UI)**	**DALYS (95%UI)**
Diarrhoeal disease	9830 (3 696-21 567)	9 (5-14)	687 (369-1 106)
Campylobacter spp.	2221 (335-8 482)	0.8 (0.4-1)	70 (41-112)
Cryptospridium spp.	205 (35-813)	0.2 (0.04-0.4)	13 (3-37)
Entamoeba histolytica	796 (98-3 868)	0.05 (0.009-0.4)	5 (0.9-39)
Enteropathogenic E.coli	454 (125-1 215)	2 (0.6-3)	140 (50-282)
Enterotoxinogenic E.coli	982 (312-2 480)	1 (0.6-3)	109 (46-216)
Giardia spp	809 (172-2 574)	0 (0-0)	0.8 (0.2-3)
Norovirus	1749 (491-5 060)	1 (0.3-3)	81 (24-185)
Non-typhoidal *Salmonella enterica*	896 (175-2 994)	1 (0.5-2)	89 (42-147)
Shigella spp.	523 (45-2 865)	0.5 (0.1-2)	43 (8-124)
Shiga toxin-producing E.coli	5 (2-9)	0 (0-0)	0.05 (0.02-0.1)
Vibrio cholorae	43 (13-101)	2 (0.5-4)	112 (35-252)
Invasive enteric diseases	425 (156-976)	5 (3-8)	307 (160-308)
Brucella spp.	3 (0.4-110)	0.02 (0.002-0.5)	1 (0.1-34)
Hepatitis A	232 (60-643)	0.5 (0.1-1)	23 (7-60)
Listeria monocytogenes	0.1 (0-2)	0.03 (0-0.6)	1 (0-21)
Mycobacterium bovis	7 (4-29)	0.5 (0.3-0.7)	30 (19-42)
Invasive non-typhoidal Salmonella enterica	25 (12-37)	3 (1-5)	169 (71-306)
Salmonella enterica Paratyphi A	25 (5-73)	0.2 (0.04-0.5)	12 (3-36)

Salmonella enterica Typhi	108 (24-317)	0.7 (0.2-2)	53 (12-155)
Total	10304 (4 279-22 108)	14 (8-21)	1001 (562-1 543)

Note: table does not include foodborne intoxications caused by *Clostridium botulinum*, *Cl. perfringens*, *S.aureus* and *Bacillus cereus* due to lack of data for global estimation

Estimates account for diarrhoeal diseases having a global burden of 99 727 954 DALYs and that 90% of these are the result of illness in lower income and lower middle-income countries (Prüss-Ustün *et al*, 2014). Africa had the greatest burden of diarrhoeal disease (around 70%) from contaminated food among all age groups: 687 DALYs (95% UI: 369–1106) per 100 000 population compared with 229 (95% UI: 160–323) per 100 000 globally and 23 (95% UI: 13–33) per 100 000 in Europe (WHO, 2015). The diarrheal disease was particularly due to non-typhoidal *S.enteric,* EPEC and ETEC with *Vibrio cholorae* and *Taenia solium also* playing an important role to the burden (WHO, 2015).

Water and the environment faecal contamination costs Mozambique an estimated US$124 million per year and is the root cause of an annual average of 8 000–10 000 cases of cholera (World Bank, 2017).

In 1992 an outbreak of bloody diarrhoea caused by *Escherichia coli* 0157 infections occurred in southern Africa and its cause was related to factors like droughts, heavy rains and contaminated surface water that increased cattle carriage of the pathogen (Effler *et al* 2001). Imposed disease of 42% among 778 residents that were investigated and the E*. coli* strain was identified in both Swaziland and South Africa. Consumption of beef and untreated water were significant predisposing factors (Effler *et al* 2001).

In September 2016 Maputo's press released an interview with a university professor from Eduardo Mondelane Veterinary Faculty who affirmed that broilers abattoir hygiene is highly compromised by the lack of good manufacturing practices (GMP) throughout the whole process of slaughter, evisceration, and packing. In the same newspaper release, two co-workers from the National Veterinary Directorate (DNAV) also confirm these findings by declaring that the microbiological results found in abattoirs and informal markets were "terrifying". They describe what has been seen during the audit period, confirming the lack of hygiene of the process, the infrastructures and workers (Jornal Domingo,2016).

In developing countries epidemiological data is scarce for nearly all hazards but even more insufficient for the overall impact of chemicals in food (WHO, 2015). An estimation of liver cancer cases due to aflatoxins was estimated by Liu *et al* in 2012 and numbers reach 88 400 cases (72 800–98 000) equivalent to 1.1 million DALYs with aflatoxins declared responsible for 17% of hepato-cellular carcinoma. Most cases occur in sub-Saharan Africa, Southeast Asia, and China where aflatoxin exposure in food is common and uncontrolled.

A study conducted in Maputo dated 2005 analysed four different animal feed factories and verified that Aflatoxin B1 concentration was on average 1.6 times superior than the amount recommended by FAO (Mondelane *et al,* 2005).

In a comparative study conducted by Jabbar and Grace, food safety policy regulations and implementations were reviewed in six sub-Saharan African countries - Ethiopia, Ghana, Kenya, Mozambique, South Africa and Tanzania. The team diagnosed that most food in the traditional /informal sector is not inspected and when it is, the food chain is not seen from a farm to table perspective. Commercial farms, abattoirs and exporters are some of the points that suffer from the weak inspection system in Mozambique, leaving the smallholder farms, informal slaughter sites and transporters left aside. For most hazards actual status is unknown; health information for foodborne illness is underestimated and risk analysis is not a tool used in government agencies' daily work.

2.10 Mozambique, the eight millennium development goals and the 2030 sustainable agenda

The Millennium Development Goals were a set of eight goals launched by the United Nations and agreed by all 191 UN member states to strive for by the year 2015 (UN, 2012). The United Nations Millennium Declaration, dated September 2000 committed world leaders to combat poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women, and achieved remarkable results (UN, 2012).

The world round mobilization behind the Millennium Development Goals has produced the most successful anti-poverty movement in history (UNDP, 2015).

From the MDG's related to the subject of study Mozambique was able to reduce poverty from 69 percent of the population in 1997 to 54 percent in 2003. Despite this achievement, in 2009 the poverty line was still 55 percent (UNDP, 2016[a]). Based on Instituto Nacional de Estatistica (INE) data from years 1997, 2008 and 2011, in Mozambique, 26 percent of children were underweight, falling to 18 percent and 14 percent respectively. The 2015 UN report declares that in developing regions, despite the large population growth, the number of deaths of children under five years old, has declined globally from 12.7 million in 1990 to 6 million in 2015 (UNDP, 2015).

In 1997 the under-five mortality in Mozambique accounted for 219 deaths per 1 000 and decreased to 97 in 2011 (UN, 2012). The immunisation level has also increased from 58 percent in 1997 to 82 percent in 2011 (UN, 2012).

Worldwide, the drinking water target was met by 147 countries (UNDP, 2015) and the proportion of Mozambican families using an improved drinking water source has increased from 37 percent in 2001 to 51 percent in 2011 (UN, 2012).

The social progress index related with access to improved sources of water and sanitation ranks Mozambique 128th and 119th, respectively, out of 135 countries (World Bank, 2016).

The success attained with the Millennium Development goals mobilizes a set of new targets inserted in the 2030 Agenda for the Sustainable Development (UNDP, 2015). The Agenda is described as "a *plan of action for people, planet and prosperity*" and in September 2015 the 17 Sustainable Development Goals (SGDs) came into force to reach what the MDG did not achieve, particularly in the most vulnerable countries (UNDP, 2015).

The progress has shown to be uneven especially in Africa and the new set of goals will guide the decisions over the next fifteen years in order to achieve a sustainable development (UNDP, 2015).

For the accomplishment of some of the SDGs food safety plays an important role, not only as part of the food security scope (SDG2), but also as a health promoter (SDG3, SDG6), trade and economic development related subject (SDG2, SDG8) (Carletti, 2016).

3 Food Safety Governance

3.1 International Institutional Framework involved in Food Safety Guidance

This chapter provides a brief overview of the international institutions involved in food safety guidance, in order to attain a logical framework of organisational links and structures of food and feed safety as well as their cooperation with the competent national public authorities.

3.1.1 WTO SPS and TBT agreements

The World Trade Organization (WTO) provides a global forum for discussion and agreement regarding the rules of trade between nations. By July 2016, 164 countries were members of the WTO, of which 36 are considered LDC's by the UN (WTO, 2017[a]).

The core of the organization consists of various WTO agreements, negotiated and signed by the entirety of the world's trading nations making it officially valid in their parliaments. WTO's mission is to assemble fundamental principles that are the foundation of the multilateral trading system, serving as a forum for trading negotiations, dispute resolution and legal ground-rules for international commerce (WTO,2015).

The WTO general principles are to ensure transparency, consistency, and predictability in international economic policies related to trade (Smith, 2006).

The WTO agreements for the two largest areas of trade- goods and services share a common framework, starting with general disciplines contained in the General Agreement on Tariffs and Trade (GATT) (for goods), the General Agreement on Trade in Services (GATS)

and the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) followed by additional agreements that deal with special requirements of specific sectors (WTO, 2014).

The Final Act of the Uruguay Round of Multilateral Trade Negotiations dated 1994 compile most of the WTO agreements which include a major revision of the original General Agreement on Tariffs and Trade (GATT) dated 1986-94 (WTO, 2017).

Trade liberalization concerns health issues in multiple ways (Smith, R. 2006). The impact can be direct like increased exposure to infectious diseases, through the rapid cross border transmission of diseases, with obvious effects, or more indirect with impact on finance, provision and distribution of health related goods and services (WHO/WTO, 2002). As a consequence, WTO rules are developed governing technical barriers to trade applied for reasons of protecting human health and wellbeing, including specifically food safety issues. Such measures are covered by both the Agreement on Technical Barriers to Trade (TBT Agreement) and the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) (WHO/WTO, 2002).

The TBT agreement focus on ensuring that regulations, standards, testing and certification procedures do not create needless obstacles regarding trade, whilst respecting the right of the nations to protect their consumers and environment from hazardous products. It is compulsory for all members and shares many of the fundamental principles such as non-discrimination, access to markets and technical assistance as well as differential treatment for developing countries (WTO, 2013). Nevertheless, the agreement also recognizes and strongly encourages the use of international standards or others considered appropriate, emphasizing the need to avoid unnecessary barriers to trade (WHO/WTO, 2002).

The TBT Agreement covers trade in all goods (including agricultural and industrial) and its scope must be considered in relation to the Application of Sanitary and Phytosanitary Measures (WTO, 2013).

SPS Agreement constitutes a commitment formed by 14 articles and three annexes that address the proper application of food safety, animal health and plant protection rules, as they relate to international agricultural trade (WTO, 2014). The Agreement allows WTO members to apply control measures to imports which afford an appropriate level of protection to consumers and farmers from relevant sanitary and phytosanitary hazards.

Some of the principles applied include transparency, equivalence, regionalization and harmonization, science-based measures and standards development, national sovereignty and dispute resolution (World Bank, 2000). These principles are intended to promote predictable and sustainable trade (EC, 2013).

WTO created a database allowing Members and users to search all notified SPS measures and Specific Trade Concerns (STCs) raised in the SPS committee. According to this database, from 1995 to 2017 food safety issues have been the second highest number of trade concerns, accounting with 133 raised notifications out of a total of 421 (WTO[b], 2017).

About two thirds of all WTO members are developing countries, playing an important and active part of the organization, not only because of their numbers but also because they view trade as a vital tool in their development strategy (WTO, 2015). Developing countries and LDC's are a highly diverse group with very different realities and concerns, so WTO agreements contains special provisions for them, with longer time periods to implement agreements and commitments and better trade opportunities (WTO, 2015). The WTO Secretariat provides technical assistance regarding training for both understanding of rights and obligations and to create support to help them build the necessary infrastructures and technical standards (WHO/WTO, 2002).

Compliance with WTO agreements account for commitment on the part of the Member States and involve several costs. Direct costs represent the one's incurred by the public sector, *i.e*. legislation development, training, inspections and testing and also upgrading of the later. On the other hand, indirect compliance costs are those met by producers or traders engaged in the supply chain involving adapting their products and production systems (UN, 2008).

SPS measures can affect trade flows for developing countries and their capability to gain or sustain access to external markets and can undermine efforts towards export-led diversification and development (SADC, 2011). This concern is even greater for low-income countries due to lack of credibility of conformity assessment bodies and weak SPS management capacities (WTO,2015). To face these internal constraints international institutions and donors play an important role in Trade Related Technical Assistance by improving compliance in developing countries, thus enhancing their ability to trade and increase the competitiveness of their exports (UN, 2008 and WTO, 2006).

In 2015 at the request of the Support Program for Economic and Enterprise Development (SPEED), a United States Agency for International Development (USAID) a study was conducted to determine the extent to which Mozambique complies with the requirements of WTO's Agreement on the Application of SPS Measures. Mozambique's SPS status and needs were considered difficult to address, but the study enabled recommendations and future areas of action for USAID projects aligned to improve transparency, harmonization, inspection and other relevant capacity building activities (USAID, 2016).

3.1.2 World Health Organization (WHO)

The World Health Organization was created in 1946 and the constitution entered into force on 7 April 1948, a date now celebrated yearly as the World Health Day (WHO, 2017). WHO is committed to the principles set out in the preamble to the Constitution and its primary role is to direct and coordinate international health (WHO, 2016).

WHO works side by side with governments and other partners to promote universal health and fulfil the mission of "the attainment by all peoples, of the highest possible level of health." (Article 1 of the WHO Constitution) (WHO, 2006[a]). To attain this purpose, the organisation provides experienced public health expertise, technical support and leadership, supporting countries and building capacity of national governments to improve their people's health (WHO, 2017).

The organization is determined to play a key role in Africa to overcome the continent's health issues and aims to work towards a strengthened African health and economic security. The WHO African region is one of the six regions of WHO and currently accounts for 47 Member states (WHO, 2015). Each African member state has a WHO Country Office (WCO) that emphasise their work according with each Country Cooperation Strategy (CCS). Mozambique's set of priorities were set for the period 2009-2013 and focus on strengthening health systems, reducing the disease burden, improving mother and child health, addressing health determinants and leadership, governance and partnership.

WHO supports countries throughout the world in building capacity to manage food safety challenges at various levels. Together with other organisations such as Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE), WHO plays a vital role to promote guidance and multifactorial responses to food safety hazards, zoonoses and other related public health threats (WHO, 2017).

An important sample of this organisational joint work is the FAO/WHO publication Assuring Food Safety and Quality: Guidelines for Strengthening National Food Control Systems that seek to provide recommendations to national authorities of developing countries on strategies to strengthen food control systems and protect public health (FAO/WHO, 2003).

3.1.3 Food and Agriculture Organization (FAO)

The Food and Agriculture Organization of the United Nations (FAO) is an agency created in the 1940's whose main goal is to achieve food security for all. Nowadays, FAO is still the only global intergovernmental organization with a vast mandate in governing the world's food and agricultural system (FAO, 2015).

FAO is formed from 194 member states, as well as the European Union, Faroe Islands and Tokelau (associate members) (FAO, 2017[a]). It comprises eight departments and numerous

worldwide offices. The organization uses its wide network of experts to provide fundamental services that strengthen global governance and help in the design of future policies that focus on mission-critical development related processes related to food insecurity and nutrition (FAO, 2017[b]).

FAO reaffirms three main goals, the eradication of hunger, food insecurity and malnutrition; the elimination of poverty, social and economic progress for all; and sustainable development for the benefit of present and future generations (FAO, 2015). The organization is now even more focused on governance due to a global recognition on the necessity of more flexible, responsive and capable governance institutions and mechanisms, as well as coordination among stakeholders, to overcome conflicting objectives and work towards achieving targets (FAO, 2017[b]).

FAO's intervention in Africa promotes an integrated programme approach to FAO's key goals and responds to member-states priorities. The work in the region has been focused on three Regional Initiatives including a call for hasty action in the fight against hunger (supporting Africa's Commitment to End Hunger by 2025), promotion of sustainable production and value chain development and building resilience in Africa's vulnerable farming communities (FAO, 2016[b]). FAO initiatives related to food safety involve direct work with governmental authorities, local industry and relevant stakeholders to ensure that consumers acquire safe food. Their activities support member countries in developing their food safety capacity considering it as a key factor to protect health and well-being as well as trade.

This international organization works closely with the Government of Mozambique focusing on the described Regional initiatives and is currently working accordingly with the Country Programming Framework (CPF) 2016-2020 for the purpose of featuring the international best practices and global standards to national and regional expertise (FAO and Republic of Mozambique, 2016).

3.1.4 Joint FAO/WHO

I Codex Alimentarius commission (CAC)

The Codex Alimentarius Commission (CAC), established by FAO and WHO in the 1960s, with its compilation of Codex standards, guidelines and codes of practice has become the global reference point for all parts involved in food. It is a landmark in contribution to the safety and quality of food as well its fair trade (FAO/WHO, 2016).

Broadly, CAC and its documents can be seen as a global rule book of the food chain based on sound scientific evidence and its contribution to food safety awareness and public health protection is countless. It causes impact on food producers and processors as well as

consumer's consciousness (FAO/WHO,2016). Although Codex standards holds voluntary national adoption, country members of WTO are strongly incentivized to harmonize with them (African Union [AU], 2013). Codex standards prevent and assist in the resolution of trade disputes before WTO (FAO/WHO, 2016).

Currently the CAC has 188 Codex Members (187 Member Countries and the EU as Member Organization) forty-eight of those member's being African countries (FAO, 2016[2]). The participation of African least developed countries in Codex has been largely enhanced due to the establishment of the Codex Trust Fund that provides support to eligible countries (WHO, 2017[a]). Most of these countries have utilized Codex standards in their food law development while others have enforced Codex Standards (FAO/WHO, 2005).

Mozambique has been a Codex member since 1984 and Codex Contact Point (CCP) is inserted in the Ministry of Health and is responsible for distributing Codex texts, coordinating the activities of Codex within the country, and supporting the National Institute of Standardization and Quality (INNOQ) in their work (FAO/WHO, 2005).

II Overview of joint FAO/WHO cooperation for development of Food Safety in Africa

Regarding African development resolutions encompassing food safety, in May 2000, the Fifty-third World Health Assembly urged member states to become more involved in food safety, and elevate its priority in the policy agenda. Development of food safety education programmes, such as the Five Keys to Safer Food WHO project, were created as regional strategies endorsed to promote food safety amongst high risk groups.

In 2003, the joint FAO/WHO publication, Assuring Food Safety and Quality: Guidelines for Strengthening National Food Control Systems, replaced the previous (1976) guidelines. The published work provided information on how to develop and improve food control systems, particularly for developing countries. It highlights the importance of mutual involvement of all stakeholders in the food chain as well as measures to strengthen national food control systems (FAO/WHO, 2003).

In 2007, at the Fifty-seventh session the WHO Regional Committee for Africa ratified the Regional Strategy on Food Safety and Health identifying key actions for strengthening national food safety systems. For this purpose, in 2012, WHO published a practical guide to help countries on the formulation of food safety policies and plans, once again trying to enhance the progress on safe food production (WHO, 2012).

A joint WHO/FAO work conducted in 2005 under the general theme of "Practical Actions to Promote Food Safety", evaluated national food safety systems in Africa. Conclusions drawn a broad perspective that every country has some sort of food safety management system in place, however the vast majority are ineffective and unsuitable for the country reality (FAO/WHO, 2005).

3.1.5 World Organization for Animal Health (OIE)

The World Organization for Animal Health is an intergovernmental organisation created in 1924 that has the responsibility of improving animal health worldwide (World Organization for Animal Health [OIE], 2017[a]).

Recognized by the WTO as a science-based standard setting organization, OIE is responsible for global animal health and welfare and also reducing health zoonotic risks as part of worldwide strategy "One Health" concept (OIE, 2015). As of 2017, OIE has a total of 181 member countries and maintains relations with more than 70 other international and regional organisations such as FAO, WTO, WHO, CAC, World Bank and many others (OIE, 2017[b]).

An example of this interlocking cooperation between organisations is the recently finished programme named "Reinforcing Veterinary Governance in Africa" (VETGOV) that pursued exchange of information between the African Union's and the OEI, enhancing countries capacity to comply with OIE standards and also a specific focus on the strengthening of veterinary legislation at both national and regional level (OIE, 2017[c]).

Under the Veterinary Legislation Support Programme (VLSP) and upon request from the Ministry of Agriculture, a mission was undertaken in 2015 in Mozambique, where the team reviewed national veterinary legislation in force in the country. Findings of the latter demonstrated that Mozambique's Veterinary legislation raises concerns, with gaps and overlaps found in a great deal of the studied elements. OIE as well as counterparts share the concern on lack of formal chain of command as well as disease surveillance system resulting in a fragmented and ineffective system (OIE, 2015). Recommendations were drawn in the light of the findings, and Mozambique was evaluated as being capable of developing national veterinary legislation up to internationally-recognized standards (OIE, 2015).

3.1.6 African Union

In May 1963, 32 African states agreed to establish the Organization of African Unity (OAU) that throughout the years has seen member numbers increasing by the time of its transition into the African Union in 2002. Currently there are 55 member states and Mozambique joined the Organization in 1975 (AU, 2017). The AU's vision is to achieve an integrated, prosperous and peaceful Africa based on cohesion and cooperation among the peoples of the Member states (AU, 2017).

The AU calls all Member states to rededicate themselves to a self-driven Africa that can represent a dynamic force on the worldwide arena (AU, 2015).

Over the past decade, since 2004, the AU Commission developed three strategic plans. The 3rd of these, for the years 2014-2017, was based on a 5 pillar configuration: Peace and

Security; Social, Economic and human Development; Integration, cooperation and Partnership; Share and Values and finally Institutions, Capacity Building and Communication. The world as well as Africa is undergoing astounding changes and Africa needs to embrace and understand this unstoppable fact (AU, 2015). The AU Agenda for 2063 represents a strategic transformational framework for the continent in the next fifty years. It is rooted in what the people of Africa want and seeks to accelerate the achievement of sustainable development and growth (AU, 2015).

The African Union Commission (AUC) Department of Rural Economy and Agriculture (DREA) embraces rural economy development and agricultural productivity, working closely with the Regional Economic Communities and other international partners. Issues like food security, poverty alleviation and harmonisation of agricultural and trade policies and strategies between RECs are part of this department mandate (AU, 2017). The bridge of command of the DREA's is the Comprehensive Africa Agriculture Development Programme (CAADP), the Africa's policy framework for agricultural and wealth transformation, food security and nutrition and prosperity for all African people (AU/NEPAD, 2003).

AUC, to enhance Africa-wide coordination of animal and plant health strategies, created technical offices like the Inter-African Bureau for Animal Resources (IBAR) and the Inter-African Phytosanitary Council (IAPSC). AU-IBAR develops and coordinates animal resources for human wellbeing, including livestock, fisheries and wildlife, and adjusts policies between AU member states. The IAPSC relates to phytosanitary and plant protection activities amongst African countries in order to improve human livelihoods and food security (AU-IBAR, 2015).

Regarding food safety issues, joint coordination between the AU and international counterparts such as the EU have contributed to harmonize food hygiene related matters with activities involving both public and private sectors. The programme "Better training for Safer Food (BTSF) Africa" is an example of this joint effort, it included training workshops within the context of the SPS agreement and building capacities were focused on issues like legal framework, technical inspection capacity and strengthening the capacity of the Regional Economic Communities, AU Commission and specialised bodies (AU/EU 2010). The Participation of the African Nations in SPS Standard Setting Organizations (PAN SPSO) was another joint funded programme created to facilitate effective participation of African countries in the activities of the OIE, IPPC and CAC during the formulation of international standards on animal and plant health, and food safety (AU-IBAR, 2015).

Partnerships between the AU and other international partners are not only part of the AU Constitutive Act objectives, they are, as well, the only way to achieve effective communication, economic integration and other major socio-development common principles and frameworks (AU, 2015).

Since no African Union structure is in place to address food safety management issues, the AUC through the AU-IBAR organized two continental workshops of food safety experts and presented the missions, functions and structures that needed to be set up (AU-IBAR,2015). The AU Food Safety Management Coordination Mechanism (AU-FSMCM) proposed mandate included food safety coordination, communication, advisory and capacity building of AU member states as well as food business operators (AU-IBAR,2015). The workshops in Kigali, 2012 and Addis Ababa 2013 produced a thorough analysis of African food safety challenges but the approval of the presented AU-FSMCM creation and missions is still in the waiting line (AU-IBAR, 2015).

The 1980 Lagos Plan of Action for the Development of Africa and the Abuja Treaty (1991) created the RECs in order to facilitate regional economic integration between individual regions. All REC's are led by a Head State or Government and are closely integrated within the African Union's work (AU, 2015).

Currently the AU recognizes eight REC's and Mozambique is part of the Southern African Development Community (SADC). Africa's regional communities constitute the nucleus for economic integration in Africa and play an important role in peace and security, working side by side with the government, civil society and the AU (AU, 2015). Member states are part of one or more REC's and implementation of the regional integration agenda is part of their conjoint treaty obligations (UN/ECA, 2017).

3.1.7 Southern African Development Community

The Southern African Development Community (SADC) was formed in 1992 as the successor of the pre-existing Southern African Development Co-ordination Conference (SADCC), relying on a more defined basis of cooperation between Member states of the region, based upon a more legally formalised intention of action (AU, 2015). Key objectives of this REC are, achieving economic development, peace and security with standard of living improvement and poverty alleviation. Once again regional integration, democratic principles and sustainable development are mandatory to fulfil main objectives (EU/SADC, 2015). SADC comprises 15 member states namely, Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe (AU, 2015).

All SADC member countries are among the ones with agriculture as the base of their economy. Food safety and trade related issues are a shared responsibility between the 15 Member states government institutions. In 1996 a Protocol on Trade in the SADC region was agreed by each member state, to create mutually equitable regional trade arrangements thereby enhancing economic development, diversification and industrialization of the Region (SADC, 1996). In 2008 SADC adopted the SPS Annex to the SADC protocol in Trade.

Accordingly, all Member states shall use the appropriate international standards and policies in accordance with their obligations in the terms of the WTO's agreements, as basis for its standard related measures. Although most members have created the formal institutions, implementation of the Annex has been lacking with some trade related disputes either being solved informally at the bilateral level or remaining unsolved (Jensen, 2011).

Economic growth and poverty alleviation in the SADC region has been catalysed by the creation of the "Regional Economic Integration Support Programme", also known as REIS programme, whose interventions in selected areas like investment, cross border payments, tax coordination, market access through European Economic Partnership (EPA) as well as TBT and SPS measures supported regional integration and development (SADC, 2012). The four-year programme, managed by SADC and funded by the EU, works to increase regional traded agricultural commodities and compliance with the international SPS standards by harmonizing SADC measures to the latter and raising awareness to involved stakeholders (EU/SADC, 2015).

Mozambique has regional trade agreements with its SADC partners based on the SADC Trade Protocol: 1996/2000 but the EU-SADC EPA, that appointed the country eligible to benefit from unilateral preferences from various WTO Members, has not yet been ratified (WTO, 2017).

In 2015, as part of the Support Program for Economic and Enterprise Development (SPEED) of the United States Agency for International Development (USAID), a study was conducted to determine the extent to which Mozambique complies with the requirements of the WTO's Agreement on the Application of Sanitary and Phytosanitary (SPS) measures. The relevance of this study relates to the agri-food export pattern of the country, mostly based on goods like fruits, nuts and animal origin products which are highly SPS sensitive. Mozambique's SPS status and associated needs were considered difficult to address, with the country facing demanding future work to comply with the requirements of the SADC SPS Annex. The study suggests future areas of action for projects and recommendations to improve transparency, harmonization, inspection and other relevant capacity building activities in this matter this way increasing the trading potential of the country (USAID, 2016).

3.2 Examples of external contributors and projects

External donors and their grants are substantial for low income countries and more evident in their effort to reach proposed development goals (International Monetary Fund [IMF], 2004). Contributions can come from a range of different sectors such as government agencies, international organizations, non-governmental organizations, foundations and private entities. In this section, some of the most relevant institutions for African development are highlighted,

in order to follow a coherent framework of action regarding food safety in both the continent and the country itself.

The World Bank and the International Monetary Fund are considered the two most powerful institutions created to raise the living standards in their Member States. A more stable and prosperous global economy is the main goal of both institutions although each other promote different economic challenges (IMF, 2017). The IMF promotes macroeconomic issues and provides policy advice and programs to build and maintain strong economies. The World Bank bases their initiatives in a more long- term economic development and poverty reduction (IMF, 2017).

The IMF provides rapid assistance to countries with emergency balance of payment need and in sub-Saharan African countries this "post disaster" assistance has been in recent years based on the reality of tragedies such as Ebola outbreaks, droughts and post conflict strategies (IMF, 2016).

The World Bank, formed in 1944, acts like a cooperative formed by 189 member countries and comprises five organizations: The International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA) and the International Centre for Settlement of Investment Disputes (ICSID) (World Bank, 2017).

The World Bank Group works with clients and all concerned global stakeholders to bring forward a more nutrition-sensitive agriculture, to promote food safety and enhance food quality, and this fact is seen through multiple approaches (World Bank, 2017[c]).

The IFC remains the largest global development institution, focused mainly on the private sector, and has established this leading position in Africa. More than $25 billion have been invested in African businesses and financial institutions and regarding the agriculture sector, the continent needs more than $10 billion invested annually to achieve the desired expansion. The organization recognizes the importance of agribusiness value chains and is helping the food sector through various measures (International Finance Corporation [IFC], 2016).

Hosted by the World Bank, a public-private initiative launched in 2012, named Global Food Safety Partnership (GFSP) devotes its efforts towards the promotion and support of global cooperation for food safety capacity building, enhancing public health incomes whilst improving agri-food values chains (World Bank, 2016).

According to the World bank database, at present 598 projects totalling $61.48bn are either approved or already in place throughout 48 African countries. Of these, 20 are undertaken in Mozambique (World Bank, 2017[c]).

The United Nations Industrial Development Organization (UNIDO) is a specialized agency of the UN that is based on Inclusive and Sustainable Industrial Development (ISID) and aims to combat poverty through industrial development (United Nations Industrial Development Organization [UNIDO], 2013).

The inclusivity in ISID context means that every country achieves a higher level of industrialization in their country and no one is left behind, gathering equal opportunities and equitable distribution of the benefits to all stakeholders. The multi-dimensional aspirations of development reached by the promotion of ISID renders all UN Members to believe that it is the cornerstone for our global economy, sharing prosperity whilst protecting the environment (UNIDO, 2014).

UNIDO's programmes embrace a mutual objective to give the country's people the tools, knowledge and infrastructure to pull themselves out of poverty and create sustainable sustenance. In 2008, the African Union Commission with UNIDO's and other key stakeholder's assistance, developed a strategy involving immediate, mid and long-term projects called "Action Plan for the Accelerated Industrial Development of Africa (AIDA)". AIDA aimed to nourish sustainable economic growth, prosperity and worldwide integration using manufacturing as the dynamic force (AU/UNIDO, 2008).

Combined efforts and continuous actions of UNIDO, African governments and other development partners shall accelerate the continent's industrial growth, add value to goods for exports and enhance local production capacities (AU/UNIDO, 2008).

In Mozambique a recent key programme was embraced by the EU, UNIDO and the Government of Austria expanding the private sector and quality promotion. Private Sector and Quality Promotion Programme for Mozambique (COMPETIR com Qualidade) granting some Mozambican companies and laboratories trust and recognition in both national and international arenas. In the programme context, technical assistance and infrastructure support was provided bringing Mozambique to a better baseline to face the challenges of globalization (UNIDO, 2016).

For the achievement of UNIDO's mandate and a more extended impact of the organization, partnerships with external partners and additional resources are mandatory. Based on the past experiences on ISID, the Organization is now focused on a new programmatic framework called the Programme for Country Partnership (PCP). As of 2015, three pilot studies on PCP approach were conducted, in Ethiopia, Senegal and Peru. The Programme for Country Partnership is a process-oriented methodology that will mobilize action of multi-stakeholders with government project ownership (UNIDO, 2017).

3.3 Private sector

The reaction to the global food crises until now has mainly been to assist with the demand for food in those countries where it is required and focused mostly on public sector stakeholders. In regard to satisfying the rising food demand, it is crucial to boost global food sustainable productivity and foster public-private investment partnerships (EBRD, 2011). Whilst government leadership position is critical for addressing food security and safety matters, businesses undoubtedly play a key role through partnerships to achieve sustainable solutions (UN, 2008).

Citing FAO, the private sector "includes enterprises, companies or businesses, regardless of size, ownership and structure. It covers all sectors of the food, agriculture, forestry and fisheries systems from production to consumption as well as associated services". FAO recognizes mutual collaboration (non-financial) and sponsorships (financial) as the two main categories of private sector collaboration (FAO, 2016[c]).

By strengthening partnerships with the private sector not only the efficiency of the complete supply chain can be enhanced so can fairer competition and a more stable business environment be enabled (FAO, 2017[a]). Transforming agricultural production to meet food security, requires a high level of collaboration between the public and private sector. Employment progress, increased production of small-scale farmers and technology update and knowledge transfer are some of the features achieved by public private partnerships. It should be not only about financial support to the sector but mostly for the use of their dynamism and motivation benefits adding mutual value to the collaboration (FAO, 2016[c]).

To address sustainable agricultural development goals, Agri-public private partnerships (PPP) were created by FAO and results have already demonstrated the benefits deriving from the combined work (FAO, 2016[c]).

In Mozambique's business history, economic liberalisation reforms started during the 1990s, and even with nearly two decades of economic increase, nowadays the private sector represents only about 65% of GDP and parallel economic activity is generalized in the country. Recent surveys show that individual businesses represent 93% of all enterprises with medium sized operators only accounting for 0.02% of the latter (UNDP, 2017).

Latest census, Censo de Empresas (CEMPRE), covering the country's formal private sector suggests that Mozambique economic growth was accomplished through an expansion in the non-extractive sector. Agriculture, livestock and fisheries account for 649 enterprises and the food industry fulfils 1 322 out of a total number of 72 742 businesses. Both sustain the biggest numbers for employment in comparison with other industries of the same division (INE,2017). The private sector is still largely dominated by a small number of big firms but

the share of SME is growing, a fact that pushes forward the overall productivity growth, desirable for the country development (World Bank, 2017).

The National Development Strategy initiated in 2014 pinpoints industrialization as the cornerstone to prosperity and competitiveness through ISID growth model. In 2016 the Mozambican government approved its new Policy and Industrial Strategy (PEI) for 2016-25 assuming the promotion and encouragement of specific sectors with food and agro-industry being two of them (UNDP, 2017). Achieving economic growth led by increased exports of agricultural products requires access to markets, which is in turn conditional on compliance with SPS conditions (USAID, 2016).

3.4 National policy, legal and institutional profile for food safety in Mozambique

In Mozambique, the President is the Head of State and presides over the Council of Ministers, composed of the Prime Minister and Ministers. Policies are formulated and implemented by the council of Ministers. Hierarchy of legal instruments are as follows:

I. laws, decree-laws, ratified international treaties and agreements
II. decrees
III. Assembly resolutions and Council of Ministers' resolutions; and
IV. Ministerial diplomas.

Legal acts of the Assembly, President and Council of Ministers are published in the Government Gazette (Boletim da República). Some relevant ministerial decrees documents are listed in table 2.

Table 2 Mozambique food relate national legislation

Legal Document	Approved for
Law nº 8/82	Regulating food safety crimes against public health
Decree nº 15/2006	Regulating the hygienic requisites for production, transport, commercialization and inspection of food (12/82)
Decree 26/2009	Regulating animal health
Ministerial Order No. 137/2007	Regulating the National Codex Alimentarius commission
Ministerial Order No. 80/87	Approving the hygiene regulation on food imports.
Ministerial Order No. 88/87	Approving the regulation on pesticides
Ministerial Order No. 100/87	Approving the regulation on additives

Ministerial Order No. 51/84	Approving the hygiene regulation of food establishments
Legislative Diploma Nº53/73	Regulating slaughterhouses.

To complete the proposed structure of the third chapter, based on the Ministries available documents and a study conducted by Munguambe and Hendrickx (2011) a brief description of the national institutions involved in food safety core of action for Mozambique is outlined below.

3.4.1 Ministry of Health (MISAU)

The last mandate update for the Ministry of Health is dated 1995 and Article 3 point 5 objectively points out the Ministry involvement in the safety of food (Decree nº 11/95).

All MISAU activities related to food safety should embrace the complete food chain and the Department of Environmental Health (DSA) seems to accomplish most of the latter. Its main activities reside in developing food regulations and coordination of the food legislation enforcement. It is the National Codex *Alimentarius* Commission focal point and the legal mandate is ratified through the Ministerial Diploma nº 137/2007.

The DSA from MISAU seems to lead Food safety legislation enforcement although similar and overlapping missions may be undertaken by other institutions, with no clear evidence of coordination between them (Jabbar & Grace, 2012).

The medical examination centre is responsible for employer's occupational health (Law decree 5/80) and the joint centre should provide the inspection of food business premises and food at entry ports as well as sustain legislation enforcement.

The Law decree nº16/91 grants MISAU the competence of water testing and also the establishment of quality parameters of water for human consumption. These are established in the Ministerial Diploma nº 180/2004. Food testing is also provided by these MISAU National laboratories for the Hygiene of food and water (LNHAA). Decree nº39/2006 regulates the quality of bottled water for human consumption.

3.4.2 Ministry of Industry and Commerce (MIC)

The Ministry of Industry and Commerce (MIC), through its department of inspection, Inspeção Nacional Atividades Economicas (INAE), is responsible for food and agricultural products testing at entry points, food business premises licensing and food safety inspection of food business operators (Jabbar & Grace, 2012).

The Ministry is also the key institution to promote trade, improve competitiveness and coordinate the various sector involved trade issues (UNDP/MIC, 2016). The statute that sets out MIC's mandate was recently adapted via Ministerial Diploma nº 36/2016.

The National Institute for Normalisation and Quality (INNOQ) created in 1993 is an institution inserted in the MIC's governance that focus its activities in the development of a National Policy of Quality based on standardization, certification and quality management (INNOQ, 2017). It represents the enquiry point for the TBT agreement of the WTO and is the International Standardization Member (ISO) for the country.

INNOQ develops supply chain activities in phases of production, processing and distribution and is the reference institute for both metrology and certification (INNOQ, 2014).

The National Institute develops Mozambique Technical Norms (NM) emanated from specific regulation and based on consensus achieved from all interested parts of each sector. INNOQ develops more than 100 NM per year and similar to the international ISO Standards, they are a normative document of voluntary action (INNOQ, 2014).

3.4.3 Ministry of Agriculture and Food Security (MASA)

In 2015 the Ministry of Agriculture and Food Security (MASA) was created, representing the government for all activities related with agriculture, livestock, agroforestry and food security. According with this presidential Act 1/2015 the MASA is responsible for proposal of food security legislation and policies and related information disclosure (MASA, 2016).

The ministry is represented by a vast number of Directorates and Departments as well as subordinated and guarded entities. The state veterinary services (DINAV), embodied by the National Directorate of Veterinary Services (DNSV) is the veterinary authority, responsible for disease surveillance and control and quality of animal products. This responsibility is established by the decree 26/2009 which regulates animal health and the DNSV is the National Notification Authority to the OIE (OIE, 2015).

Inserted in MASA there is also the Central Veterinary Laboratory Directorate of Animal Sciences (DCA) responsible for research and analysis of feed and food of animal origin, the Biotechnology Laboratory (IIAM) attending GMO's matters and research on food plant improvement, and the Plant Protection Department (DSV) regulating SPS measures and functioning as the National Enquiry Point for the WTO's SPS measures agreement (Vernooij *et al*, 2016).

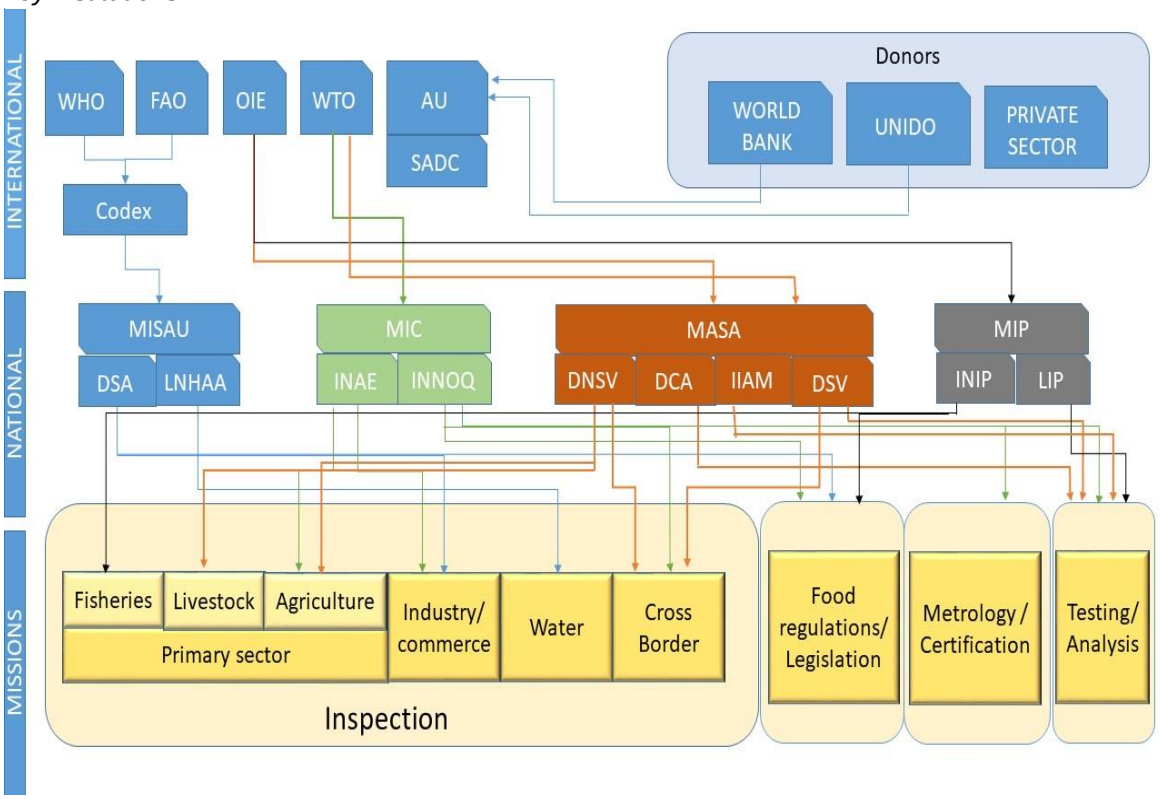
3.4.4 Ministry of Fisheries

All food safety issues, trade, legislation and analysis related with the fisheries sector is regulated by the Ministry of Fisheries (MIP) through the National Institute for Fisheries Research (INIP) and the Fisheries Inspection Laboratory (LIP) (MIP, 2015).

3.4.5 Overview of food safety institutions

To better comprehend the complexity of the involved stakeholders in food safety management issues, a simplified diagram was created, depicting the structure of international and national organizations, governmental and non-governmental and supposed

Figure 3 Simplified depiction of food safety authorities in Mozambique based on consultation with key institutions



hierarchies and considerable overlapping missions. Authorities are referred by their acronym.

Every country presents some kind of a food safety management system in place at the national level. What can be debatable is whether they are effective and suitable for the purpose of assuring safe food for either regional or external markets.

In Mozambique various Ministries and Departments are involved in food safety regulation activities resulting, most likely, in a duplication of efforts and inefficient use of resources. The effectiveness of the framework of action can only be achieved if collaboration and coordination exists which is not often the case, leaving important tasks such as inspection

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authors have described the existence of an International Food Safety Complex (IFSC), and described its regional application in the SADC region, the IFSC concept suggests a coherent and structured approach to reform and strengthening of food safety control measures, for which no evidence was found in this case study.

Many international organizations at various official occasions can be notably named regarding their involvement in food safety activities at regional and national level. FAO and WHO guidelines provide consistent procedures for the countries on the formulation of food safety policies and suggestions for the implementation of the strategic plan.

It is widely acknowledged that African countries are at various stages of food control engagement and food safety issues are differently recognized by each country. In some countries problems and approaches for solutions are being addressed. Others have not responded to African wide initiatives and recommendations.

6 Conclusions and Recommendations

6.1 Conclusions

With the recognition that food security only exists when all people have physical and economic access to sufficient, safe and nutritious food, inherent links between food safety and security become well established. In developing countries where food supplies are scarce, effective food control systems appear to be a secondary priority to food supply although both are essential elements contributing to food security. This fact can pose food as a health risk affecting the consumer, the country's economy and perpetuating the poverty cycle.

Despite the efforts of international organizations to strengthen food safety in African developing countries, the reality of the case study has shown that huge gaps and challenges remain. Existing guidelines provide procedures for the countries on the formulation of food safety policies and suggestions for the implementation of a strategic plan. Developing countries do differ in their requirements for effective food control systems and some countries have assessed and developed their food safety system whilst others remain without evident action.

The case study is based on the development of a food safety management systems for a SME business in Mozambique and the experiences encountered when trying to ensure compliance with the existent national framework and requirements for food safety. The case study successes and failures can be seen as the reality suffered by entrepreneurs of the food

industry when trying to implement an effective and legally compliant food safety system from farm to fork.

Case study experiences show that safe food products can be achieved but several extrinsic insurmountable barriers are found on the procedure. National existing laws are outdated, and no regulatory food safety policy was found, leaving the FBO without a clear message regarding what must be done to achieve a safe and compliant food business. The case study demonstrated that basic public health deficiencies such as poor water quality, lack of sanitation and pest control are a constraint for whichever system is applied. Food safety management and its law enforcement is unclear and quality assurance or formal food safety systems are not often applied by food and feed operators of the domestic market.

Continental and regional food safety initiatives are in place and Member states have been called to action by international and regional bodies. Whilst some countries are demonstrating a response, like South Africa, Ghana, Kenya and Mali, many others have not yet embraced recommendations of creating a clearer policy and governance leadership to achieve food safety. In Mozambique, the main drivers underpinning food safety implementation are international impositions to achieve export markets. Although some advances in food safety have been observed, there are areas where progress can be considered non-existent. There is an urgent need for promotion of future actions in the country, a proactive attitude from governmental institutions and the engagement of involved stakeholders.

Like other developing countries, Mozambique needs to address food safety concerns as a whole including public health, domestic and international trade market perspectives.

6.2 Recommendations

The final aim of this dissertation is to transform the insight of Mozambique food safety reality into a streamline of food safety considerations as well as to suggest some realistic key points that could direct the achievement of safer food chains in developing countries. The study has helped to lay bare a number of important gaps resulting in the following recommendations for future actions.

6.2.1 Undertake a detailed S.W.O.T analysis

A S.W.O.T. analysis is a process that tracks strengths, weaknesses, opportunities and threats. National capability of developing food laws was considered a Strength but Weaknesses prevail through the analysis and these include outdated legislation, undefined food safety policy, non-existence of risk assessment and limitations of basic infrastructures such as poor quality of water, lack of sanitation and pest control.

The general objective of an official, more comprehensive and multidisciplinary situation analysis in Mozambique is to formally and entirely analyse the existing food safety status of the country and to generate viable solutions to improve it, as a starting point for development of a national food safety policy and strengthening strategy. The need for a deep realigning of the organizational structure, shifting mandates from ministries and reforming the food safety system, demands a strong process governance that should be addressed by the most senior level of the Government.

6.2.2 Establish a legal and regulatory framework

The country must prioritize the establishing of appropriate food laws and regulations. Harmonization of laws according with the mandatory international requirements from institutions as WTO (within SPS and TBT agreements), OIE and CAC is urgently needed. Food legislation has to embrace the country's reality and international obligations, clarify food safety acts in a coordinated and integrated manner and define the mandates of different authorities.

The legislative framework for food safety matters in Mozambique has to address elements of the domain in a more comprehensive way. Above all, it has to provide a high level of health protection. Definitions and obligations in the food chain supply must be clarified and subjects like traceability, full risk assessment and provisional measures must be formally addressed.

Current discharge and conflict of responsibilities must be halted by drafting proper legislation with recognized mandates and applicable policies. For example the creation of a single government department or a national food control authority may be considered as a viable option.

6.2.3 Food standard system and control

Food control systems should cover all foods and not be sectoral based. The national strategy to ensure safe food has to be defined for the complete supply chain and applicable to all types of FBO's. Evident disparities of standards requirements, ranging from a high safety level to meet export requirements and non-existence of standards when trading in domestic markets, should cease. The proposed policy framework should ensure integration and provision of education for all stakeholders in the food chain- government, industry and consumers- therefore sharing responsibilities to achieve safe and wholesome food.

Food control systems should have a statutory basis and be presented as mandatory, with penalties applied to noncompliance.

6.2.4 Review the risk analysis strategy

In line with WTO's SPS agreement, Mozambique should base its regulatory actions on scientific risk analysis in an integrated farm-to-table concept. Food safety decisions and regulatory sanitary measures cannot be properly addressed without a scientific based approach. Hazards should be scrutinized in a more realistic perspective and whenever possible, at a national or regional level. The risk they pose for consumers should be assessed, managed and clearly linked to the country's targeted level of protection, standards and inspection systems.

6.2.5 Public and government intervention support

Public efforts need to be directed to prevent and control hazards as a public good. Limitation in basic infrastructures such as quality of water and sanitation should not continue to be a constraint to a food safety control system. Donor and government efficiency in the use of funds should increase access to clean water supply and sanitation in both urban and rural areas.

Government intervention should also integrate funding business incentives to assist the FBO for compliance with food safety systems. Supporting the entrepreneur by upgrading facilities, creating a more reliable electricity supply supporting refrigeration to enhance the preservation of food are examples of governmental assistance for the procurement of compliable food safety systems.

6.2.6 Create funds to improve inspection, technical assistance and training enhancement.

Mozambique should join other continental forces and strengthen regional cooperation to enhance information, education, communication and training. Private funds could be applied for improvement of infrastructures and training.

The regulator authority should address specific expertise of food inspectors and laboratory analysts as a priority. A well-established national programme of food inspection can serve as a preventive function and skills improvement will ensure fairness and credibility to the inspection official act. Ongoing programmes of human resources should be established.

6.2.7 Establishment of an appropriate information network

Communication of food safety issues should be addressed properly by the food safety system. Mozambique needs to strengthen the country's epidemiological surveillance and develop information networks for incident report within the territory.

Food safety related information exchange should extend beyond national borders and be integrated within continental / global food safety networks. Recommendations for the Missions, Functions and Structure of African Union Food Safety Authority and a Rapid Alert System for Food and Feed should be approved by the AU. Until this mechanism is approved and established, reform must be led by regional bodies (REC'S) and national impositions for trade and development. Established trade-based approaches should not leave domestic markets aside.

Transparency of the food control system and how food safety information is delivered to the public affects both consumer's confidence and effectiveness of the system. Information should be delivered in a way that food safety awareness is promoted and engagement between consumer and FBO's is created to achieve a common objective, the consumption of safe food.

6.2.8 Stakeholders engagement in order to create better, stronger and long-term partnerships

All stakeholders have a legitimate interest in improving food safety and their role should be emphasized. Industry, trade organizations and consumers should have their interests and proactive opinions taken into account by food safety authorities.

Mozambique should strengthen and sustain public private partnerships to effectively address food safety as a public health right, optimise trade opportunities benefiting the country's sustainable development in the future.

References

African Union (AU). (2015). Agenda 2063 The Africa We Want. Popular Version. ISBN: 978-92-95104-23-5. Consulted on the 20 of August 2017 in http://www.un.org/en/africa/osaa/pdf/au/agenda2063.pdf

AU (2017[a]). Member State Profiles. Consulted on the 20 of August 2017 in https://au.int/en/memberstates

African Union and New Partnership for African Development (AU and NEPAD). (2003). Comprehensive Africa Agriculture Development Programme. ISBN 0-620-30700-5. Consulted on the 20 of August of 2017 http://www.fao.org/nr/water/aquastat/sirte2008/NEPAD-CAADP%202003.pdf

African Union Comission and New Zealand Crown. (2017). African Union Handbook 2017 (Vol 4), pp. 74-94.

African Union, Agences Des Norms et de la Qualité, European Union (AU/EU) (2015). Report of the meeting of the 6th pan-African meeting of national codex contact points venue:

Ouagadougou, Burkina Faso DATES: 15-18, June 2015. Consulted on the 20 of August 2017 in http://www.au-ibar.org/component/jdownloads/finish/30-panspso/2265-report-of-the-meeting-of-the-6th-pan-african-meeting-of-national-codex-contact-points

Albuquerque, A.; Hobbs,A. (2016) Challenges and Opportunities for Efficient Land Use in Mozambique: Taxes, Financing, and Infrastructure. Climate Policy Initiative

Ali, Mohammad., Lopez, Anna., You, Young., Kim. Young, Sah. Binod, Maskery, Brian. & Clemens, John 2011 The Global Burden of Cholera. Bulletin of the World Health Organization 2012;90:209-218A. doi: 10.2471/BLT.11.093427

Amanam, U. (2017) Natural Gas in East Africa: Domestic and Regional Use Pre-symposium white paper for: Reducing Energy Poverty with Natural Gas: Changing Political, Business, and Technology Paradigms May 9 & 10, 2017 Stanford University, CA

Araffin, A. (2011). Food Control and Consumer Affairs in Developing Countries, Food and Agricultural Organization's Corporate Document Repository, Rome, Italy. Consulted on the 18 of August 2017 in http://www.fao.org/docrep/V2890T/v2890t0b.htm.

AU (2008). African Union Strategy for the implementation of the plan of action for the accelerated industrial development of Africa. AU/MIN/CAMI/3(XVIII)

AU (2013). African Union Strategic Plan 2014:2017. Consulted on the 20 of August 2017 in https://au.int/en/auc/strategic-plan-2014-2017

AU (2017a) African Union Member State Profiles available at https://au.int/memberstates consulted on the 20th October

Baş, M., Yüksel, M., Çavuşoğlu, T. (2007). Difficulties and barriers for the implementing HACCP and food safety systems in food businesses in Turkey. Food Control. 18. 124-130. 10.1016/j.foodcont.2005.09.002.

Beegle, Kathleen, Luc Christiaensen, Andrew Dabalen, and Isis Gaddis. 2016. Poverty in a Rising Africa. Washington, DC: World Bank. doi:10.1596/978-1-4648-0723-7. License: Creative Commons Attribution CC BY 3.0 IGO

Boughton, D., Mather, D., Tschirley, D., Walker, T., Cunguara, B., and Payongayong, E. (2006). Changes in Rural Household Income Patterns in Mozambique, 1996-2002, and Implications for Agriculture's Contribution to Poverty Reduction. Ministry Of Agriculture, Directorate of Economics. Research Report No. 61E

Carletti, C. (2016) Food security and food safety: a new human approach in the SDGs perspective Rome, Italy

Codex Alimentarius Commission (CAC). (2003). GENERAL PRINCIPLES OF FOOD HYGIENE. CAC/RCP 1-1969. 4º Revision. Consulted on the 29 of August 2017 in www.fao.org/input/download/standards/23/CXP_001e.pdf

CAC (2003). Hazard analysis and critical control point (haccp) system and guidelines for its application Annex to CAC/RCP 1-1969 (Rev. 4 - 2003)

Darwish WS, Ikenaka Y, Nakayama SM, Ishizuka M. (2014). An overview of mycotoxin contamination of foods in Africa. J. Vet. Med. Sci. 76:789-797.

Decree nº 15/2006 June 22nd Regulating the Hygienic requisites for production, transport, commercialization and inspection of food (12/82)

Delgado, C.; Rosegrant, M.; Steinfeld, H.; Ehui, S.; Courbois, C. 1999. Livestock to 2020: the next food revolution. IFPRI Food, Agriculture, and the Environment Discussion Paper 28. Washington, D.C. (USA): IFPRI.

Department for International Development (DFID). (2017). Annual Report and Accounts 2016-17. Consulted on the 10 of September 2017in www.gov.uk/government

DNEAP (2013). 2012 Survey of Mozambican Manufacturing Firms. Inquérito as Indústrias Manufactureiras 2012 (IIM 2012). National Directorate of Studies and Policy Analysis, Ministry of Planning and Development, Republic of Mozambique.

Effler, E., Isaäcson, M., Arntzen, L., Heenan, R., Canter, P., Barrett, T., … Griffin, P. M. (2001). Factors contributing to the emergence of Escherichia coli O157 in Africa. Emerging Infectious Diseases, 7(5), 812–819.

EU (2017) http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc_113422.pdf

European Union/Southern African Development Community EU/SADC (2016) Economic Partnership Agreement (EPA) between the European Union and the Southern African Development Community (SADC) EPA Group

European Bank for Reconstruction and Development) (EBRD) (2011) Private Sector for Food Security Initiative Annual Report 2014 consulted on the 15th of August at www.erbd.com/agribusiness

EU/SADC (2015) EU SADC Regional Economic Integration Support, Consulted on the 21 of September 2017 https://ec.europa.eu/europeaid/sites/devco/files/safer-sadc-agricultural-commodities-and-agro-processed-goods_en.pdf

Famine Early Warning System Network (FEWS NET) (2016) consulted on 20 March 2017 at http://www.fews.net/southern-africa/mozambique

Food and Agriculture Organization (FAO) (1994). Manual on meat inspection for developing countries. D.Herenda in cooperation with P.G. Chambers A. Ettriqui P. Seneviratna T.J.P. da Silva FAO Animal Production and Health paper 119

FAO (1996) World Food Summit 1996, Rome Declaration on World Food Security

FAO (1998) The Ten Commandments of the Sanitary and Phytosanitary Agreement of the World Trade Organization consulted on the 10 august 2017 at http://www.fao.org/ag/againfo/resources/documents/Vets-l-2/7engArt.pdf

FAO (2002) The State of Food Insecurity in the World 2001. Rome ISBN 92-5-104628-X consulted on the 21 of May 2017 at http://www.fao.org/docrep/003/y1500e/y1500e00.htm

FAO (2006) Strengthening national food control systems: Guidelines to assess capacity building needs. Food and Agriculture Organization of the United Nations (FAO), Rome, Italy consulted on the 10 of October 2017 at http://www.fao.org/docrep/fao/009/a0601e/a0601e00.pdf.

FAO (2011) 2010-2011THE State of Food and Agriculture- Women in Agriculture. Closing the gender gap for development ISBN 978-92-5-106768-0

FAO (2013) FAO Strategy for partnerships with the private sector E-ISBN 978-92-5-107935-5, consulted on the 15 November 2017 at http://www.fao.org/3/a-i3444e.pdf

FAO (2013a) Report of the FAO/WHO workshop on “National Food Control Systems” Palais des Congrès Yaoundé, Cameroun 28 January 2013. consulted on the 20 of November 2017 athttp://www.fao.org/fileadmin/user_upload/agns/news_events/1_preccafrica%20report%20.pdf

FAO (2015) Basic Texts of the food and agriculture organization of the United nations volumes I and II 2015 pp:117-121;133-135.

FAO & Republic of Mozambique (2016) Country Programming Framework for Mozambique 2016-2020 July 2016

FAO (2016a) The State of Food and Agriculture. Climate Change Agriculture and Food Security ISBN 978-92-5-109374-0

FAO (2016b) FAO Regional Conference for Africa Twenty-Ninth Session Abidjan, Côte d’Ivoire, 4-8 April 2016 Results and Priorities for FAO in the Africa Region consulted on the 10 december 2017 at http://www.fao.org/3/a-mq472e.pdf

FAO (2016c) Public–private partnerships for agribusiness development – A review of international experiences, by Rankin, M., Gálvez Nogales, E., Santacoloma, P., Mhlanga, N. & Rizzo, C. Rome, Italy

FAO (2017) Membership of FAO. Consulted on the 20 of May 2017 at http://www.fao.org/legal/home/membership-of-fao/en/

FAO (2017a) Private Sector consulted on the 22 of august of 2017 at http://www.fao.org/partnerships/private-sector/en/

FAO (2017b) About FAO, Structure and Finance consulted on the 22 of august 2017 at http://www.fao.org/about/who-we-are/en/

Food and Agriculture Organization and World Health Organization FAO/WHO (2003). Assuring food safety and quality: guidelines for strengthening national food control systems. FAO Food and Nutrition Paper 76. Food and Agriculture Organization of the United Nations and World Health Organization, Rome, 2003.

FAO/WHO (2005) Report of Sixteenth Session of the Codex Committee for Africa, Rome, Italy, 25–28 January 2005 CX/AFRICA 05/16/4

Global Competitiveness Index (GCI) (2016-2017) The World Economic Forum ISBN-13: 978-1-944835-04-0

Grace, D. 2015. Food Safety in Low and Middle Income Countries Int. J. Environ. Res. Public Health 2015, 12, 10490-10507; doi:10.3390/ijerph120910490

Goertz, H. (2014) Innovation for Agricultural Training and Education. Mozambique: Background Study, September 29, 2014 USAID/BFS/ARP-Funded Project Award Number: AID-OAA-L-12-00002

Herges, L, Kaus, Susanne., Böl, Gaby-Fleur., Gollnick, Nicole. (2017) Food Safety Almanac Special Edition Community of Portuguese Language Countries (CPLP) Bundesinstitut für Risikobewertung (BfR), Federal Institute for Risk Assessment in Cooperation with ASAE.

Hornsby, D. and Mukumba, C. (2011) The International Food Safety Complex in Southern Africa: Cooperation or Competition? South African Journal of International Affairs, Vol. 18, No. 2, pp. 235-256, 2011. Available at SSRN: https://ssrn.com/abstract=1899494

International Finance Corporation (IFC) (2016) The First six decades leading the way in private sector development. Second edition

International Monetary Fund IMF (2004) External Grants and IMF Policies consulted on the 15 of October 2017 at https://www.imf.org/external/np/exr/ib/2004/092104.htm

IMF (2016). Regional economic outlook. Sub-Saharan Africa. ISBN: 978-1-47551-987-7

IMF (2017) International Monetary Fund fact sheet 2017.- The IMF and the World Bank consulted on 15 of October 2017 at http://www.imf.org/About/Factsheets/Sheets/2016/07/27/15/31/IMF-World-Bank?pdf=1

INE (2017) Instituto Nacional de Estatística _ Censo de Empresas 2014 - 2015: Principais Resultados – Moçambique.

INE (2011) Censo Agropecuário 2009 – 2010: Resultados definitivos – Moçambique 2011 Instituto Nacional de Estatística – Moçambique.

INNOQ (2014) Catálogo de Normas Moçambicanas Autor: Instituto Nacional de Normalização e Qualidade Produção: Dércio Felisberto Elias e Jovita Candida Cruz available at http://www.innoq.gov.mz/index.php/por/Normalizacao/Normas-Aprovadas

INNOQ (2017) Instituto Nacional de Normalizaçao e Qualidade available at www.innoq.gov.mz
Instituto Nacional de Estatística. (2012). National data for monitoring the Millennium Development Goals. Mozambique. Consulted on the 15 of September 2017 in http://www.dst.dk/ext/798633178/0/mozambique/MDG-Fact-sheet-Mozambique-Updated-August-2012--pdf

Inter-African Bureau for Animal Resources (AU-IBAR). (2013). Manual for Africa's CODEX contact points Sponsored by the U.S. Codex Office, in consultation with the African Union Interafrican Bureau for Animal Resources. 2013 Edition, pp 1- 28.

Inter-African Bureau for Animal Resources (AU-IBAR). (2015). Recommendations for the Missions, Functions and Structure of African Union Food Safety Authority and a rapid alert system for food and feed. Consulted on the 20 of August of 2017 in www.au-ibar.org

Jabbar, M; Grace, D; (2012) Regulations for safety of animal source foods in selected Sub-Saharan African countries: Current status and their implications
Jensen, M. (2011) for USAID and Southern Africa. United States Agency for International Development. Technical Report: Developing the SADC Approach to SPS Issues available at http://www.rr-africa.oie.int/docspdf/en/2011/Jensen.pdf

Jornal Domingo. (2016). Há que mudar as regras de abate do frango. Consulted on the 26 of August 2017 in http://www.jornaldomingo.co.mz/index.php/reportagem/8218-ha-que-mudar-as-regras-de-abate-do-frango

Kaneda, T.; Bietsch, K. (2016). "2013 World Population Data Sheet". Consulted on 3 February 2017 www.prb.org. Population Reference Bureau. Consulted on 3 February 2017.

Kaferstein, FK. (2003) Food Safety: the fourth pillar in the strategy to prevent infant diarrhoea. Bulletin World Health Organization. 2003;81(11):842-3. Epub 2004 Jan 20

Kirby, Roy. 1993 HACCP in practice. Roy Kirby describes its sized enterprises (SMEs) available at https://repositorio.ucp.pt/bitstream/10400.14/5458/4/FOOD_CON_5230-236.pdf

Legislative Diploma nº 53/73 -series – nº 137-24/11/73 Regulating slaughterhouses.

Lineback, D. R., Pirlet, A., Van Der Kamp, J. and Wood, R. (2009), Globalization, food safety issues & role of international standards. Quality Assurance and Safety of Crops & Foods, 1: 23-27. doi:10.1111/j.1757-837X.2009.00005.x

Liu, Y.; Wu, F. Global burden of aflatoxin-induced hepatocellular carcinoma: A risk assessment. Environ. Health Perspect. 2010, 118, 818–824.

Kirk, Martyn D Angulo, Frederick J, Havelaar, Arie H., Black, Robert E. (2017). Diarrhoeal disease in children due to contaminated food. In Bulletin of the World Health Organization, pp:95:233-234. Consulted on the 15 of September 2017 at http://dx.doi.org/10.2471/BLT.16.173229

MASA (2016) Ministério da Agricultura e Segurança Alimentar. O MASA Contexto Legal Available at http://www.masa.gov.mz/index.php?option=com_content&view=article&id=215&Itemid=62

Mengel MA. (2014) Cholera in Africa: new momentum in fighting an old problem. Trans R Soc Trop Med Hyg 108(7):391–2. Available:http://www.ncbi.nlm.nih.gov/pubmed/24836060 PMID: 24836060

Mensah P., L Mwamakamba, C Mohamed, D Nsue-Milang (2012) Developing and maintaining national food safety control systems: experiences from the WHO African region available at African Journal of Food Agriculture, Nutrition and Development Vol 12 nº4

MENON (2010). SMEs and growth in Sub-Saharan Africa. Identifying SME roles and obstacles to SME growth. MENON-publication no. 14/2010

MINAG (2010) Republic of Mozambique Ministry of Agriculture. Strategic plan for agricultural development, PEDSA 2010-2019.

Ministerial Order No. 51/84 October 3rd Approving the hygiene regulation of food establishments

Ministerial Order No. 80/87 June 1st Approving the hygiene regulation on food imports.

Ministerial Order No. 100/87 of September 23rd Approving the regulation on pesticides

Ministerial Order No. 137/2007 October 24th Regulating the National Codex Alimentarius commission

Ministerial Order No. 153/2002 September 11th Approving the regulation on pesticides

MIP (2015). Ministério do Mar, Águas interiores e Pescas. Available at http://www.mozpesca.gov.mz/index.php/pt/

MOH (2013) Ministry of Health Draft – 31.05.2013 National food safety policy Government of the Republic of Ghana Ministry of Health available at http://www.acfs.go.th/FileSPS/Text%20SPS%20GHA%201.pdf

Mondelane, I. A., Capece B.P.S., Parruque A.F. Relação entre a Ocorrência de Fungos e a Presença de Aflatoxinas B1 em Rações para Aves Fabricadas em Maputo

MSchou, S. and Cardoso, J. (2012) (How Many Manufacturing Firms Are There in Mozambique? Learning to compete. Working Paper nº21 consulted on the 22 of October at

https://www.brookings.edu/wp-content/uploads/2016/07/L2C_WP21_Schou-and-Cardoso-1.pdf
Munguambe, L. and Hendrickx, S.C.J. 2011. Safety of animal sourced foods in Mozambique: A situational analysis. Safe Food, Fair Food Project. CGIAR, Research Program on Agriculture for Nutrition and Health.

OECD/FAO (2016), OECD-FAO Agricultural Outlook 2016-2025, OECD Publishing, Paris. ISBN: 9789264253230 (PDF) Available at http://dx.doi.org/10.1787/agr_outlook-2016-en

OECD/FAO (2016), OECD-FAO Agricultural Outlook 2016-2025, OECD Publishing, Paris. http://dx.doi.org/10.1787/agr_outlook-2016-en. pp 131-136

World Organisation for Animal Health (OIE) (2015) Veterinary legislation Support Programme Report of the Veterinary Legislation Identification mission Republic of Mozambique, 5-9 October 2015

OIE (2015) The sixth strategic plan 2016-2020 draft prepared by the council, February 2015 available at http://www.rr-africa.oie.int/docspdf/en/2016/6th_strategic_plan.pdf

OIE (2017a) International agreement for the creation of an office international des epizooties available at http://www.oie.int/about-us/key-texts/basic-texts/international-agreement-for-the-creat ion-of-an-office-international-des-epizooties/

OIE (2017b). OIE Member Countries available at http://www.oie.int/about-us/our-members/member-countries/OIE

OIE (2017 c) World Animal Organization Bulletin 2017-2 available at http://www.oie.int/publications-and-documentation/bulletins-online/

Pitoro, R., Chagomoka, T. 2017 Food Security Dynamics and Its Drivers in Rural Mozambique. International Journal of Sciences, Volume 6, Issue 5, pp55-65

Portal do Governo de Moçambique. (2004). Constituição da República de Moçambique, incluindo as revisões de 1994 e 2004. Consulted on the 15 of September 2017 at http://www.mozambique.mz/pdf/constituicao.pdf

Probst, C. R. Bandyopadhyay, P.J. Cotty. Diversity of aflatoxin-producing fungi and their impact on food safety in sub-Saharan Africa International Journal of Food Microbiology

Prüss-Ustün, A., Bartram, J., Clasen, T., Colford, J. M., Cumming, O., Curtis, V., … Cairncross, S. (2014). Burden of disease from inadequate water, sanitation and hygiene in low- and middle-income settings: a retrospective analysis of data from 145 countries. Tropical Medicine & International Health, 19(8), 894–905. http://doi.org/10.1111/tmi.12329

Southern African Development Community SADC (2008) Revisiting Regionalism in Southern Africa Proceedings of the Fourth Southern African Forum on Trade (SAFT), held in Pretoria, South Africa, on 3–4 September 2007 ISBN 978-1-920216-06-1

SADC (2011) Regional Guidelines for the Regulation of Food Safety in SADC Member States Published by SADC through the Food Safety – Capacity Building on Residue Control Project, FANR November 2011

SADC (2014) Sanitary and Phytosanitary (SPS) Annex VIII to the SADC Protocol on Trade approved version – Committee of the Ministers of Trade - 17 July 2014 SADC/CMT/26/2014/8.2

SADC (2015) 35th Summit of SADC Heads of State and Government. 17-18 August 2015 Gaborone Botswana

Sandbrook, R. (1996), Democratization and the implementation of economic reform in Africa. J. Int. Dev., 8: 1–20. doi:10.1002/(SICI)1099-1328(199601)8:1<1::AID-JID285>3.0.CO;2-

SETSAN (2002) National Executive Secretariat of Food Security and Nutrition Republic of Mozambique Food and Nutrition Security Strategy English version available at https://sarpn.org/documents/d0001192/P1324-Mozambique_SETSAN_2002.pdf

Smith, R, 2006. Trade and public health: facing the challenges of globalisation Journal Epidemiology Community Health. 2006 Aug; 60(8): 650–651. doi: 10.1136/jech.2005.042648 PMCID: PMC2588067

The Observatory of Economic Complexity (OEC). (2017). Importer and exporters. consulted on the 13 of august 2017 in http://atlas.media.mit.edu/en/profile/country/moz/

Schillhorn van Veen, International trade and food safety in developing countries, Food Control, Volume 16, Issue 6, 2005, Pages 491-496, ISSN 0956-7135, https://doi.org/10.1016/j.foodcont.2003.10.014.

Trading Economics. (2017a). Mozambique exports. Consulted on the 15 of September 2017 in https://tradingeconomics.com/mozambique/exports

Trading Economics. (2017b). Mozambique imports. Consulted on the 15 of September 2017 in https://tradingeconomics.com/mozambique/imports

Transparency International. (2017). Corruption Perceptions Index 2016. Consulted on the 10 of September 2017 in https://www.transparency.org/news/feature/corruption_perceptions_index_2016

United Nations (UN) (2017).. World Population Prospects: The 2017 Revison. Consulted on the 15 of September 2017 in https://www.un.org/development/desa/publications/world-population-prospects-the-2017-revision.html

UN Comtrade. (2017). The International Trade in Goods and Services. Department for International Trade and the Department for Business, Energy and Industrial Strategy in the UK. Consulted on the 8 of September 2017 in https://comtrade.un.org/labs/BIS-trade-in-goods

UN, (2008) United Nations. Food sustainability a guide to private sector action, Published by the United Nations Global Compact Office, September 2008.

UN/ECA (2017) United Nations Economic Commission for Africa. Regional economic Communities. Consulted on the 20th June 2017 at https://www.uneca.org/oria/pages/regional-economic-communities

United Nations Development Programme UNDP (2015) Human Development Report 2015. Work for Human Development. ISBN: 978-92-1-126398-5

UNDP (2016) Human Development Report. Briefing note for countries on the 2016 Human Development Report Mozambique

UNDP (20161) Human Development Report. Human development for everyone ISBN: 978-92-1-060036-1

UNDP (2017) United Nations Development Programme. African Economic Outlook 2017.Entrepreneurship and Industrialisation. ISBN 978-92-64-27426-6

UNDP/MIC (2016) United Nations Development Programme and Ministry of Industry and Commerce. Positioning of Mozambique in the International Trade.

United Nations Industrial Development Organization (UNIDO) (2013) . Fifteenth session of the UNIDO general conference Lima, Peru, 2 December 2013 Resolution GC.15/Res.1 Lima Declaration: Towards inclusive and sustainable industrial development

UNIDO (2014) Inclusive and Sustainable Industrial Development. Creating shared prosperity | Safeguarding the environment

UNIDO (2017) UNIDO's Programme for Country Partnership (PCP) Framework available at https://isid.unido.org/files/PCP-brochure-full.pdf

Unnevehr, L. (2014) Food safety in developing countries: Moving beyond exports. Global Food Security published for International Food Policy Research Institute

United States Department Agriculture (USDA) (2003) International Trade and Food Safety: Economic Theory and Case Studies Chapter 1 Introduction and Overview Agriculture Economic Report number 828 pp 1-9

United states Government and Mozambique (2011) USG/Mozambique Feed the Future Strategy FY 2011-2015 Multiyear strategy

USDA (2015) Mozambique Agriculture Fact Sheet. Mozambique Agricultural Economic Fact Sheet Foreign Agricultural Service United States Embassy in Mozambique

United Sates Agency International Development (USAID) (2005) Corruption Assessment: Mozambique final report December 16, 2005

USAID (2016) Sanitary and Phytosanitary measures assessment of the status of implementation of the WTO agreement in Mozambique available. Feed the Future: Building Capacity for African Agricultural Transformation (Africa Lead II). AID-OAA-A13-00085

Vernooij, A., dos Anjos, M., van Mierlo, J., 2016: Livestock Development in the Zambezi Valley, Mozambique: Poultry, Dairy and Beef Production. Wageningen UR (University and Research) Centre for Development Innovation. Report CDI-16-027. Wageningen

Waters (2014) Securing Food Safety to Leverage Economic Growth Opportunities in the African Food Sector: Speeding Progress, Advancing Partnerships and Sustaining Momentum

World Food Programme (WFP) (2016). World Food Programme. Mozambique Trend Analysis: Key Food Security & Nutrition Indicators

World Health Organization (WHO) (2006) Five Keys to Safer Food Manual ISBN 9241594632
WHO (2014) Twelfth General Programme of Work 2014–2019 Not merely the absence of disease. GPW/2014-2019

WHO (2015) World Health Organization. WHO estimates of the global burden of foodborne diseases: foodborne disease burden epidemiology reference group 2007-2015. ISBN 978 92 4 156516 5

WHO (2015a) WHO Regional Office for the African region. The Transformation Agenda of the World Health Organization Secretariat in the African Region 2015 -2020 AFRO Library Cataloguing-in-Publication Data ISBN: 978-929023282-7

WHO (2016) Global guardian of public health available at http://www.who.int/about/what-we-do/global-guardian-of-public-health.pdf?ua=1

WHO (2016a) Constitution of the World Health Organization Basic Documents, Forty-fifth edition, Supplement, October 2006

WHO (2017a) Codex Trust Fund. Available at http://www.who.int/foodsafety/areas_work/food-standard/codextrustfund/en/ visited on 19th august 2017

WHO (2017b). WHO Regional office for the African region. Available at http://www.afro.who.int/ consulted on the 3rd October 2017

WHO and FAO (2016) Understanding codex. Codex Alimentarius. Food and Agriculture Organization of the United Nations and World Health Organization Rome 2016. ISBN 978-92-5-109236-1

World Bank (2000) "The Development Challenge in Trade: Sanitary and Phytosanitary Standards", Submission by the World Bank to the WTO SPS. G/SPS/GEN/195

World Bank. 2012 World Development Report 2012 Gender Equality and Development. The International Bank for Reconstruction and Development / The World Bank DOI: 10.1596/978-0-8213-8810-5

World Bank (2015) Mozambique agricultural sector risk assessment. Agriculture global practice note — October 2015 | 7

World Bank (2016) The World Bank Annual Report

World Bank (2017). Country Overview. The World Bank Group. Consulted on the 8 of September 2017 in http://www.worldbank.org/en/country/mozambique/overview

World Bank (2017a). Mozambique Economic Update, A Two Speed Economy

World Bank (2017b) World Bank Data available at https://data.worldbank.org/topic/agriculture-and-rural-development consulted on the 4th March 2017

World Bank (2017c) The World Bank Global Reach Map available at http://maps.worldbank.org/p2e/mcmap/map.html?org=ibrd&level=region&code=AFR&title=Africa consulted on the 1th October 2017

World Bank & CGAP Consultative Group to Assist the Poor (2016) National Survey and Segmentation of Smallholder Households in Mozambique Understanding Their Demand for Financial, Agricultural, and Digital Solutions

Central Intelligence Agency (CIA) (2017) The World Fact Book available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/mz.html consulted on the 10th August 2017

World Trade Organization (WTO) (2014) The WTO agreements series. ISBN 978-92-870-3836-4

WTO (2015) Understanding the WTO. ISBN 978-92-870-3748-0

WTO (2017) World Trade Organization. Trade Policy Review Mozambique WT/TPR/S/354 pp 1-97

WTO (2017a) World Trade Organization. Updates available at (http://www.wto.org, “About WTO”)

WTO(2017b) World Trade Organization Sanitary and Phytosanitary Information Management System, available at http://spsims.wto.org/en/PredefinedReports/STCReport consulted on the 22th September

World Trade Organization / World Health Organization (WTO and WHO) (2002) WTO Agreements and Public Health WHO ISBN 92 4 156214 5 WTO ISBN 92-870-1223-7

Annex